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ROYAL BOTANIC GARDENS, KEW.

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OF

MISCELLANEOUS INFORMATION.

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XIII.—A REVISION OF BRACHYSTEGIA.

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In the Flora of Tropical Africa (1871) only three species of *Brachystegia* were described. Since then the great increase in our knowledge of the botany of Central Africa, especially of Rhodesia, Nyasaland and the Congo, has brought to light a large amount of additional material. This is particularly well shown in the case of *Brachystegia*, of which there are enumerated fifty-four species in the present revision; seventeen of these are described here for the first time.

The economic importance of this genus is indicated in the following notes made by one of us on a visit to Rhodesia and the Belgian Congo in 1919. Owing to the unsatisfactory state of the genus as represented in herbaria, it was found impossible to name the species correctly without making a complete revision. For this purpose we have had the privilege of examining the types from the herbaria in Berlin, Brussels, Upsala and the Natural History Museum, S. Kensington. We are much indebted to the Directors of these institutions for their kindness in lending us these specimens, without which the task would have been impossible.

Distribution.—The genus *Brachystegia* is confined to equatorial Africa, none of the species being known to occur north of 10° N. lat. or south of the Tropic of Capricorn (unless possibly an odd species occurs a little south of Inhambane, in Portuguese East Africa). It is of interest to find that the species extend

Explanation of Plate II.

Fig. 1. MooTawndu, (*Brachystegia sp. ?*) *Burtt Davy* 17897. Photograph by Mr. Burtt Davy, near Luishisi Copper Mines, Belgian Congo, Aug. 1919.

Fig. 2. MooSaamba, (*Brachystegia filiformis ?*). A tree left standing from the original forest beside the main road leading to the Governor-General's Residence, Elisabethville, Belgian Congo. Photograph by Mr. Burtt Davy, Aug. 1919.

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so much farther south of the Equator than north of it. Only nine of the fifty-four species are known to occur north of the Equator, five of them being confined to that area.

The species are mainly restricted in distribution to the dry Savannah Forest of the Great Central Plateau; only a few (possibly ten) are found in the coastal rain-forest area below 600 ft. elevation. The majority (80 per cent.) occur on the great plateau lying between Angola and Nyasaland.

Of the 54 species known, 34 are endemic in a single State, 13 in two States, and 3 in three States, leaving only four species (*B. Woodiana*, *B. utilis*, *B. apertifolia* and *B. Randii*) widely distributed.

The distribution and endemism by States is shown in the following table :—

	Number of species.	Endemics.
Kenya Colony	2	1
Uganda Protectorate	1	0
Tanganyika Territory	16	10
Nyasaland Protectorate	9	3
Portuguese E. Africa	7	1
Rhodesia	17	4
Angola	10	6
Belgian Congo (Katanga Province)	18	6
Upper Guinea	6	5
		36

Habit.—All the species of *Brachystegia* are trees with fibrous bark sometimes containing tannin; in this respect they contrast sharply with the allied genus *Cryptosepalum*, which is always an undershrub with annual shoots from a woody rootstock.

Leaves.—The leaves are always alternate and paripinnate; the leaflets vary greatly in number, ranging from about 60 pairs (*B. microphylla*) to 2 pairs (*B. Gairdnerae*, page 142, fig. 11). It is of interest to note that the latter extreme reduction is accompanied by the entire suppression of the sepals; *B. Gairdnerae* is apparently the most reduced example of the genus. Useful specific characters are derived from the position of the midrib, which is almost marginal in some species (*B. taxifolia*, etc.). The leaflets are always opposite except in *B. filiformis*, where they are rarely subopposite, and in *B. Klainei* (page 142, fig. 4), in which the lower are quite alternate and the terminal opposite. So far as is known the leaflets are sensitive and they are often closely imbricate when specimens are gathered.

Stipules and Stipels.—The stipules furnish a useful character for the subdivision of the genus; in the majority of the species they are very early deciduous and are not present at the time of flowering. In about 10 species, however, they are more or less persistent and have a broad foliaceous base with a long

terminal appendage (*see* page 142, figs 8, 10, 12). In several species the leaf-rhachis is more or less enlarged below the insertion of the leaflets sometimes forming wings or definite stipel-like appendages.

Inflorescence.—This is always terminal and either a panicle or a spiciform raceme; the bracts are usually caducous.

Bracteoles.—Constantly two in number, and are like a 2-lipped valvate calyx, in which respect they closely resemble those in the allied genus *Berlinia*. *Calyx.*—Composed of usually 5 free and often very minute ciliate sepals, sometimes reduced to one or none (*B. Gairdnerae* and *B. Bakeriana*). *Petals.*—Entirely wanting or represented by very small scale-like bodies (*B. spicaeformis*). The absence of petals distinguishes the genus from *Berlinia*, from which *Brachystegia* would appear to be derived. *Stamens.*—United at the base only or into a fairly long tube. *Ovary.*—Usually stipitate, rarely sessile, hirsute as far as known; ovules few. *Legume.*—Woody, oblong, truncate at the apex, opening with some force, the valves twisting in the process. *Seeds.*—Much-compressed, hard, more or less orbicular.

The Economic Value of the Brachystegias.

The great central plateau of southern tropical Africa is mainly covered with shadeless dry Savannah Forest, composed largely of leguminose trees. Among these the Brachystegias occupy a prominent place; indeed they form such characteristic, and in places dominant, features of the forest over thousands of square miles of country extending from the Limpopo-Zambesi Watershed to the Katanga Plateau at the head-waters of the Congo River, and from Nyasaland to the Angolan Highlands, that this plant-formation may well be termed "Brachystegia Forest." The general features of this type of Savannah Forest are indicated in the photograph reproduced on Plate II, fig. 1.

The several species of *Brachystegia* are more or less gregarious, one or other being the most common tree in particular localities. In Portuguese East Africa, also, Sim(1) notes that there is in many places an almost pure forest of one species (probably *B. Bragaei*) of which "the re-growth is excellent" and the tree is inclined to monopolize suitable districts. In the mChopes country, where extensive cultivation was abandoned about 1877, there was in 1909 a dense forest of seedling Brachystegias, 6 to 8 m. high, and 15 cm. in diameter, ready for the first thinning.

The quantity of forest products available over such a vast area of country, and where the species are so plentiful, is enormous, and this fact so impressed the traveller in Rhodesia and the Katanga Province, that extensive enquiries were made as to the possible application of these resources to industrial purposes. The information gained from various sources shows the existence of a hitherto unsuspected supply of valuable products awaiting exploitation.

Uses of the bark.—Among the natives of Central Africa, the bark is the most useful product of the *Brachystegia* tree, and serves them for an extraordinary number of purposes; in fact, certain species appear to be almost essential to their existence in the present state of native economy.

Sim(1) considers that the utilization of *Brachystegia* bark in Portuguese E. Africa "is a forest problem of equal importance with the utilization of all the timber in the Province, and well deserves skilled management, and may some day bring a large revenue."

In 1907 enquiries from the United States were received as to the occurrence and use of Brachystegia bark-cloth in the Transvaal and adjacent territories; these suggested a possible commercial value for the article if obtainable in quantity and at a reasonable price. A note published in the Transvaal Agricultural Journal(2) called attention to the matter and asked for further information. In December 1908, the following unsigned letter was received in response :—"In your 'Journal' for Jan. of 1907 which has just come into my possession I noticed some remarks therein *re* 'Brachystegia barkcloth'; the description and bark leads me to think that I have an enormous quantity of a very similar tree on this farm, so I am taking the liberty of sending you 3 (three) different kinds of bark taken from trees here, one or more of which may be suitable for the requirements of your American enquirer. These barks are used extensively by both natives and farmers for building purposes; the natives also utilize it for weaving into grain sacks and game nets. When damp it becomes quite pliable and very strong, but very brittle when dry. The natives chew the bark before using it for the manufacture of game nets and snares. The sample marked 'Makevuti' is considered the strongest. 'M'donde' comes next, and 'M'Sassa' third."—(Unsigned), Glen Avon, Salisbury, December 7th, 1908.—The specimens of bark never arrived, and the name of the correspondent was not traced.

A letter was also received from Mr. Tom Oxden-Willows, who wrote that he had seen the tree, as described in the Journal, in the Melsetter District of Rhodesia; the kind known as "M'Tonda" (*B. edulis ?*) existing in very large quantities between Umtali and Melsetter, where it had been cut for telegraph poles.

The Native Commissioner, Melsetter, kindly supplied the following information about three kinds of Bark-cloth trees :—

1. A tree called "Muwuzhe" which grows to about 30 feet in height. Bark smooth and of a light grey colour. Leaves are in pairs on the stalk and are about 1½ inches long, and about ½ inch wide and of a dull green. Trees found at an altitude of about 2,500 to 3,000 feet, in large numbers.

2. A tree called "Mufuti" (probably *B. Boehmii* or *B. filiformis*) grows to about 20 feet in height, has a rather rough bark of a dark grey colour and leaves very similar to the "Muwuzhe." It is found in great numbers at an altitude of 2,500 to 3,000 feet.

3. "Musaasa" (probably *B. Randii*) is by far the most common of the bark trees and is found all over Southern Rhodesia at an altitude of from 3,000 to 6,000 feet. It grows to 30 or 40 feet in height, has a rough outer bark in the large trees but almost smooth in the young trees. The leaves are bright green when mature, but in the early Spring they are of a great variety of beautiful colours in red and pink. They are arranged in pairs on the stalk like those of the preceding trees and are about $2\frac{1}{2} \times \frac{5}{8}$ inches in size.

The trunks of the "Musaasa" vary in diameter from 8 to 24 inches. The "Muwuzhe" trunks are about the same size, but the "Mufuti" are seldom more than 12 inches in diameter. The "Muwuzhe" and "Mufuti" barks are used for making game nets, fishing lines, bags, and blankets. That of "Musaasa" being much inferior is principally used for making blankets and sacks, it is not strong enough for nets and game traps. As far as is known this is not an article of commerce in the country, hence no market price can be given.

Tan-bark.—The bark of one of the mooSaambas (*B. tamarindoides* or *B. utilis*) is used in the Katanga for tanning hides. A sample was secured which has been examined at the Imperial Institute, through the courtesy of Professor Wyndham R. Dunstan, F.R.S. It was found to contain only 6·6% of tannin, too small a quantity to make it of commercial interest in Europe in competition with materials of better quality. It produced, however, a pale reddish brown, soft leather, of promising quality, and there seems to be no reason why the bark should not be used locally in Rhodesia for tanning purposes. Information was received that in the Katanga the bark of a mooSaamba had been found to contain up to 30 % of tannin; probably this was a different species from the one from which the sample referred to above was obtained.

The bark of "*B. spicaeformis*" of Sim (not of Benth., probably *B. Bragaei* or *B. Randii*) of Portuguese E. Africa, is said to contain about 18 % of tannin; Sim suggests that as there is such a vast quantity of it available, the tannin might be extracted on the spot and exported, as is done in the case of the Wattle bark of Natal, with considerable profit. The seeds also which are produced in enormous quantities, and which weigh well, he thinks "will be found to contain a lot of tannin."

Speke and Grant noted that a "blood-red juice" exuded on cutting the bark of *B. Randii*, in Tanganyika Territory, and Dr. Rand notes that in Rhodesia, where the same species is very plentiful, it yields "large quantities of a gum deep red in colour and very rich in tannin, which should be of some commercial value." A gum is also obtained from *B. eurycoma* of S. Nigeria; a brown resin from *B. leonensis* of Sierra Leone, and a dyestuff (a resin?) from a species of the allied genus *Berlinia* (*B. Baumii*) of Angola.

The bark of *B. mpalensis* of the Katanga Plateau and N.W. Rhodesia is a native remedy for coughs (*Rogers*).

Fibre.—On the south Tropical African plateau the bark of certain species is the principal source of fibre for the manufacture of rope, cord, string, thread, game-nets, snares, fishing-lines, sacks, grain bags, etc. The twine is quickly prepared by rubbing between the palms of the hands. The following species have been reported as yielding bark used for cord, etc.; doubtless other species of the genus are also so used :—*B. stipulata*, *B. filiformis*, *B. Boehmii*, *B. utilis*, *B. tamarindoides*, *B. edulis*, *B. Randii*, *B. Bragaei*, and the allied *Berlinia globiflora*.

Bark-cloth.—Before the widespread introduction of cotton goods, the principal clothing worn by the natives of the Brachystegia Forest region was made of fibrous sheets beaten out of the bark of several species of *Brachystegia*, and *Berlinia*, and also of a species of *Ficus* (*F. natalensis*).(4) Roscoe(6)(3) states that King Semakokiro of Budu, in the western part of Uganda, who lived about 150 years ago, is said to have compelled all his people to cultivate the bark-cloth tree (*Ficus natalensis* ?), and that bark-cloth became the national dress of the Baganda in the reign of King Semakulu, about 100 years ago. Semakulu made laws that each peasant should plant a number of the trees on his land, and also that every man and woman should be clothed, for till then the natives were practically naked. This was not done from any sense of decency, but because bark-cloth yielded revenue to the King. But the use of bark-cloth is now fast disappearing, Roscoe states, owing to the introduction of unbleached calico, "which is of a stronger texture, more durable, and more easily cleaned." "It is a pity," he adds, "that the bark-cloth industry, which was so extensive and so useful, should be allowed to die; if only some other use could be made of the bark-cloth, it would be an advantage to the natives, who would reap some benefit from the trees on their estates." Sim (1) notes that in the northern districts of Portuguese E. Africa, the natives make all their cloth from the bark of *B.* (*Bragaei* ?) and other species of the genus *Brachystegia*.

Preparation of Bark-cloth.—In Angola, according to Welwitsch, the bark was boiled and "prepared" for manufacture into white sheets. Roscoe describes the making of bark-cloth as practised in Uganda when he was there, as follows :—The tree-trunk was stripped to a height of eight or ten feet according to the height at which the branches forked; where the trunk was stripped it was smeared with cow-dung and wrapped round with plaintain leaves; a new bark soon formed which after ten or twelve months was ready to be used for bark-cloth. The third and fourth barks thus obtained were the finest in quality, though the tree might yield up to eight or more barks.

The bark used is the inner, or second, bark of the tree; both barks are removed from the tree together, and the outer, which is thin, is then scraped off. The inner bark is left during the

night to dry, and any soft, pulpy substance is scraped off the inside. The worker then lays the strip of bark, which is some four to six feet long, on a log with a flattened surface, and beats it with a mallet(5) which is not unlike a stone-mason's, but has ridges cut round it, thus leaving fine lines on the bark-cloth as it is beaten. The man goes over the material with the mallet until it is beaten out to the thickness of strong brown paper, and by the time he has finished a strip of bark which was four feet long by eighteen inches wide will have become about six feet long and four feet wide. It is then spread out in the sun to dry, and the exposure to light gives the upper surface a tint somewhat like terra-cotta, while the underside is of a lighter shade. Any holes where branches have grown or any flaws in the cloth are cut into neat squares and patched with pieces taken from the edges so deftly that in a well-made bark-cloth they are not noticeable. These cloths are usually made up by the men into sheets eight feet square, two lengths being stitched together and pressed in such a manner that the seam is not seen when the cloth is being worn. For thread they use strips of fibre from the dry plantain stem. Women rarely, if ever, learn to stitch these, and the work is left to the men, for sewing is not the women's work, and it is only where there are mission schools that women are now being taught to use the needle. (*Roscoe.*[3])

Further information on the preparation of Uganda bark-cloth is given by Roscoe in his book "The Baganda."

"The trees grow readily and rapidly, and yield annual barks of good quality for some seven years; they require no cultivation." "The cost of bark-cloth lay in the labour of growing the trees, stripping them of their bark, and beating it out to the required thickness; this was, after all, trifling in a land where time is of little value." (*Roscoe.*)

In the district of Sango, in the kingdom of Budu, are said to grow trees which produce the finest kind of bark-cloth in Uganda, of a better quality and a richer colour than any other. This particular species is said not to grow freely in other places, and it is uncertain whether it is a *Brachystegia*, a *Berlinia*, or a *Ficus*. Only one species of *Brachystegia* (*B. venosa*) is known to occur in Uganda.

The following species, and perhaps others also, are known to furnish bark suitable for making cloth:—*B. Boehmii*, *B. Woodiana*, *B. Randii* and *Berlinia globiflora* of Tanganyika Territory, Nyasaland and Rhodesia; *B. longifolia* and *B. utilis* of Nyasaland; *B. Bragaei* of Rhodesia and Portuguese E. Africa, which is said to furnish exceptionally good bark-cloth; *B. edulis* of Kenya Colony, Tanganyika Territory and Rhodesia; *Berlinia Baumii* of Angola; and *Ficus natalensis* which extends from Uganda south to Natal.

Water-baskets.—Sim (1) states that in the sandy districts of parts of Portuguese East Africa, where water is only obtainable at distances of several miles, the water-basket is an implement

of immense utility. The basket is made by ringing the tree at two places 4 to 5 feet apart, and by "cutting down one side and removing the piece of bark intact, the two incurved sides are kept apart and in place by skewers, the ends are doubled up and the met edges sewn together at the corners, and the cross ends sewn to the skewer nearest to each," the sewing being done with fibre made from the same bark. These baskets last well and do not leak, and though the removal of the bark kills the trees, this is of little consequence as they are so abundant. "I saw water brought up out of a well 20 metres deep by means of a half-inch rope of the twisted bark of the branches; this bark is also used for hinges and whatever other purposes fibre can be used for; a piece subjected to a strain of 400 pounds did not break, though it stretched out considerably" (*Sim*).

Other Uses of the Bark.—The bark of *B. Allenii* of Portuguese E. Africa, of *B. tamarindoides* of Angola and the Katanga and of *B. Woodiana*, in Tanganyika Territory, is used for making native river craft.

Speke and Grant, and Welwitsch, stated that the bark of certain species (*B. Woodiana*, *B. tamarindoides* and *B. Randii*) was also made into kilts, cloths, boxes, corn-bins and huge grain-stores, baskets, mats, matches, lashings, roofing for camp-huts, etc.

Sim ([1]) states that in the northern districts of Portuguese E. Africa one species (probably *B. Bragaei*) "is perhaps the most important tree in the Province, under its present circumstances." The natives of the mChopes district "make all their water baskets, beer vessels, grain drums and cordage from its bark," and only use the bark of another tree for making bark-cloth because that of the latter is more easily prepared; throughout the Province, north of the Limpopo, they use the bark of this *Brachystegia* only, for making cradles, coffins and beehives.

Timber.—The timber of *B. mpalensis*—which is described as a large tree—is said to be excellent for constructive purposes (*Deschamps*). That of *B.* (*Bragaei?*) of Portuguese E. Africa "takes part in all domestic woodwork construction," being "hard and durable" (*Sim*). That of *B. edulis* of Kenya Colony, is said by Battiscombe to be easily worked, well-marked, but not durable.

That of *B. longifolia* of Nyasaland is described by Buchanan as very soft.

The wood of one of the Portuguese E. African species (the "*B. appendiculata*" of Sim) is described as compact, of medium weight (50 lbs.), reddish-grey colour, with good surface; rings 6 mm. apart; pores scattered, very large; rays not visible (*Sim*).

In Southern Rhodesia one of the mSaasas is used for telegraph poles.

The wood of other species (e.g., *B. Woodiana*) is used for the rafters of sheds, native huts, etc. It is largely used for fuel

for running the locomotives on the railways of the Katanga, in the absence of local supplies of coal and its consequent cost.

The question of the possible utilization of these large supplies of wood, in the preparation of charcoal, wood-distillation products, and paper pulp, is worth investigation.

Edible seeds.—The seeds of *B. edulis* are said to be eaten by the natives of the Batoka Highlands of N.W. Rhodesia, and according to Sim, those of *B.* (*Bragaei* ?), also, are edible.

Fodder.—The pods of *B. Woodiana* are said to be a favourite food of elephants (*Rand*).

General Features of the Brachystegia Forest.

The main *Brachystegia* forest occupies the northern belt of that great tract of Savannah Forest which extends from Mafeking and the Magaliesberg northward to the great Congo Basin which forms such an effective barrier to plant-migration. Broadly speaking, it is similar in aspect and general character (though not in botanical composition) to the "Bushveld" of the Transvaal, Bechuanaland and Southern Rhodesia south of the Zambesi–Limpopo watershed.

The deciduous period of the *Brachystegia* forest is very brief—perhaps not more than two or three weeks of winter (at the end of July and beginning of August). A striking feature of the forest at this period is the beautiful leaf-colouring of some species of *Brachystegia*. This varies from pale green, light green and olive green, through yellow, bronze, brown, red and scarlet to delicate shades of pink and purple. As lighted up by the afternoon sun against a background of dark green forest, the effect is extremely beautiful, and one never to be forgotten. A peculiar and interesting feature of this phenomenon is that it is the tender spring foliage which assumes these rich tints, whereas in the north temperate zone it is the autumn foliage of the oaks, maples, etc., which produces such brilliant colouring. And whereas the adult *Brachystegia* leaves are usually more or less chartaceo-coriaceous in texture, the young foliage is so thin and translucent that De Wildeman named a specimen in that early stage as variety *papyracea* of *B. Hockii*.

The *Brachystegia* forest affords but little shade despite the comparatively dense growth of trees, and the ground beneath is well covered with grass and herbaceous or suffrutescent vegetation. There is little or no bush undergrowth, except on cut-over ground. The trees are scattered at intervals of 6 to 12, 20 or 30 ft., rarely more, sometimes less, according to age and size, or the character of the soil. They are as a rule slender for their height, varying from 8 ins. to 3 ft. in diameter, occasionally attaining to 4 ft. and, rarely, even to 5 ft. Their height is usually about 50 ft., on some soils only 20 ft.; on deep rich soils the trees attain a height of 75 or 80 ft., but these larger trees usually represent other genera. The surface of the forest

as seen from above is fairly level. Much of the branching occurs at two-thirds to one-half the height from the ground, and many trees form only two, or three, primary branches; the branching is mostly at an angle of 30° to 40° so that the spread of the head is narrow in proportion to the size of the tree (*see* Plate II, fig. 1). A few large trees occur here and there which have a much more spreading habit, *e.g.*, the nGanza (*Brachystegia mimosaefolia*) and the mooSaamba makooba (*see* Plate II, fig. 2).

Soil Requirements.—The reproductive capacity of a tree, and its soil requirements, are important factors in its economic exploitation. Species which require very rich soil, or which are reproduced with difficulty, cannot be utilized with profit unless the products obtained are of high commercial value. But given the opposite conditions, even cheap products may be handled profitably. Several of the Brachystegias are found occupying thin shaley and quartzite soils, so shallow or so poor in supplies of plant food that many other forest trees of the same Phyto-geographical Region fail to grow there. This is so marked a feature of some species of this genus, that local residents of Rhodesia and the Katanga are able to say that where certain Brachystegias are gregarious, the soils are very poor and unfit for agriculture. This may not apply to all the species, but it is noteworthy that on the strips of deeper and richer soil along the stream banks, Brachystegias are largely replaced by trees of other genera.

Seed Dispersal.—Brachystegia pods are woody and very rigid. When ripe, these pods open with explosive violence, under changes of temperature, each valve of the pod twisting corkscrew fashion with such force that the seeds are shot out. The twisted valves are so rigid that any force applied in an attempt to straighten them out results in the valve breaking into sections.

The seeds are large, flat, hard and shining, and during the fruiting season can be picked up in quantity beneath the trees. The dense growth of seedling Brachystegias on abandoned agricultural land in Portuguese E. Africa, has already been referred to. Coppicing from the stumps of cut-over *Brachystegia* forest is very noticeable in the Katanga Province of the Belgian Congo.

That Brachystegias will thrive on comparatively thin and poor soils, that seed is readily obtainable, and that the trees reproduce freely from seed and by coppicing, are important economic factors in the problem of afforestation of tropical soils of poor quality.

Vernacular Names.

There is some confusion in the application of native names to the trees of the Katanga Province, due to the number of native tribes and languages there brought together from different parts of Central Africa for the development of the copper-mining industry.

Sometimes the same name is used for the same tree by more than one tribe, but in some cases each tribe has a different name for the same tree. In other cases, however, the same name is applied to different species of the same or of allied genera, thus producing great confusion in tree nomenclature. The following native names, used in the Katanga, were carefully identified with the specimens, and checked, and in some cases re-checked, by questioning different natives at different times. It was interesting to note how keen the natives were, in certain cases, to discriminate between allied species some of which bore a close superficial resemblance; in other cases they would "lump" species under one vernacular name, possibly because the particular tree was equally useful (or useless) from their particular point of view.

In the following list the language or country in which the vernacular name is used follows in brackets after the name; the collector is responsible for identifying the vernacular name with his specimen, and his name appears in brackets after the specific name; for the specific names attached to the specimens, we alone are responsible; where these were not seen the probable species (based on the geographical distribution and other available information) has been assigned with a query. It is unfortunate that the name mooSaamba or mooZamba is promiscuously assigned to several of the multifoliate species with resulting confusion as to specific identity, as some of them are of particular economic value. The prefix moo (i.e., tree?) often spelt mu, has the long oo sound, and consequently the phonetic rendering has here been adopted.

Akolodo (Yoruba) = *B. eurycoma* (Millson)
amaChibero (Mashona) = *B. filiformis* (Swynnerton)
Bodgei (Sierra Leone) = *B. leonensis* (Lane-Poole)
Kapootoo (Chindao, Kibembe) = *B. Hockii* (Verdick?), *B. mpalensis* (Rogers), *B. spicaeformis* (Burtt Davy)
Kasosolwa (Katanga); has been referred to *Brachystegia*, but the material is incomplete (Ringoet 32)
Kisamba-Kwe-Kwe (Katanga) = *B. katanyensis* (Verdick)
Lamba, or Samba? (Angola) = *B. Gossweileri* (Gossweiler)
mBombo (Chilundi) = *B. filiformis* (Rogers)
mChenga (Tanganyika Terr. & Mlanje) = *B. Randii* (Speke & Grant, Purves)
mDonde (Glen Avon, near Salisbury, S. Rhodesia); specimens not seen.
mJombo (Mlanje) = *B. Boehmii* (Purves); see also nJombo
mNenga (Tanganyika Terr.) = *B. Randii* (Speke & Grant)
mNondo (Rhodesia) = *Berlinia globiflora* (Eyles, Monro)
mPutchi (Chilunda) = *B. mpalensis* (Rogers)
mPootu (Katanga) = *B. spicaeformis* (Ringoet)
mRihi (Kidyo) = *B. edulis* (Battiscombe)
mRiti (Suswahili) = *B. edulis* (Battiscombe)
mSaasa or mSassa (Mashona) = *B. Randii* (Rand, Eyles); *Berlinia globiflora* (Marshall); see also mooSaasa

mTagata (Echuabo of Quelimane) = *B. microphylla* ? (Sim)
mTamba (Landin & Butonga) = *B. Bragaei* ? (Sim)
mTete (Angola) = *B. obliqua* (Gossweiler); see also mooTete
mTonda (Mashona) = *B. edulis* ? (Tom Oxden Willows; specimens not seen)
Macarara (Suahili of Magenja da Costa) = *B. Bragaei* ? (Sim)
Machabel (Mashona) = *B. Woodiana* (Rand)
Malevooti (Salisbury District); specimens not seen
Mapootoo (Chikaundi) = *B. mpalensis* (Rogers); see also Kapootoo
Marotta (Echuabo of Quelimane) = *B. Bragaei* ? (Sim)
Mecombo (Tanganyika Terr.) = *B. Woodiana* (Speke & Grant)
Messina (Echuabo of Quelimane) = *B. pectinata* (Sim)
Mondi (Echuabo of Quelimane) = *B. Woodiana* (Sim)
moTondo (Batoka Highlands) = *B. edulis* (Kirk); *Berlinia globiflora* (Swynnerton); see also muTawndu and mTonda
mooAngombe (Angola) = *B. Bakeriana* (Gossweiler)
mooBanda (Angola) = *B. spicaeformis* (Gossweiler); but mooBanga is an *Afrormosia*, in the Katanga
mooFooti (Mashona) = *B. filiformis?* (specimens not seen); but mooFootoo is a *Vitex* sp., in the Katanga.
mooKootoo (Katanga) = *B. Hockii* (Verdick)
mooPanda or mooPondo (Angola) = *B. spicaeformis* (Welwitsch) and *Isoberlinia* sp. (Dawe)
mooSaamba kiloko, i.e. little, (Katanga) = *B. tamarindoides* (Burtt Davy)
mooSaamba makooba, i.e. big, (Katanga) = *B. filiformis* (Burtt Davy)
mooSaamba (Katanga) = *B. utilis* (Burtt Davy); see also mooZamba, mooSamba and Samba
mooSaasa (Melsetter District) = *B. Randii* ? (Native Commissioner); specimens not seen; see also mooTsatsa; in the Katanga Province the same mooSaasa is applied to an *Albizzia* (Burtt Davy 17817)
mooSamba (Chikaundi and Chinyanga) = *B. filiformis* (Rogers); see also mooSaamba
mooShobi (Angola) = *B. Bakeriana* (Gossweiler)
mooShovi (Angola) = *B. Hockii* (Gossweiler)
mooTagata (Echuabo of Quelimane) = *B. microphylla ?* (Sim)
mooTawndoo (Katanga) has been referred to *Brachystegia* but the material is incomplete; may be a *Berlinia* or *Isoberlinia ;* see also Tondo
mooTsaka (Gazaland) = *B. edulis* (Swynnerton).
mooTsatsa (Gazaland) = *B. Bragaei* (Swynnerton); see also mooSaasa
mooTete (Angola) = *B. Bakeriana* (Gossweiler); see also mTete
mooWuzhe (Melsetter District) = *Ficus* sp. ? (Native Commissioner); specimens not seen
mooZamba (Angola) = *B. apertifolia* ? (Welwitsch); see also mooSamba

Mumbu (KotaKota) = *B. filiformis* (Rogers)
Munzi (Chindao) = *B. Fischeri?* (Swynnerton)
nGanza (Katanga) = *B. mimosaefolia* (Burtt Davy)
nGuanzo (Tanganyika Terr.) = *B. Goetzei* (Goetze)
nJombo (Shire Highlands) = *B. longifolia* (Buchanan); see also mJombo
Nangwesu (Mlanje) = *B. utilis* (Purves)
Panda verdadeira, i.e. genuine Panda, (Angola) = *B. spicaeformis* (Welwitsch)
Samba or Saamba (Angola) = *B. Bequaertii*, *B. puberula* and *B. Gossweileri?* (Gossweiler); see also mooSaamba
Sandwe (Katanga) = *B. stipulata* (Verdick)
Tondo (Shangaan and mChopes) = *B. Bragaei?* (Sim); see also mooTawndoo
Tzontzo (Portuguese E. Africa) = *B. Bragaei?* (Sim)
umBfooti (Chindao) = *B. Boehmii* (Swynnerton), and *B. filiformis* (Swynnerton); see also mooFooti

Key to the Species.

Section 1. Stipulatae. Stipules with a large foliaceous base and linear appendage, more or less persistent during flowering (*see* page 142, figs. 8, 10, 12).

Leaf-rachis and leaflets glabrous :
- Base of stipules more or less reniform :
  - Sepals tomentose, about 1·5 cm. long; leaflets oblong-elliptic, 3–4 cm. broad; stipules 1·5–2 cm. broad ..... 1. **lufirensis.**
  - Sepals glabrous except the margin, striately ribbed; leaflets 1–2 cm. broad :
    - Calyx about 1·5 cm. long; leaflets narrowly oblong-elliptic; stipules about 1·5 cm. broad 2. **stipulata.**
    - Calyx about 0·5 cm. long; leaflets elongate-oblong; stipules about 0·7 cm. broad .... 3. **Holtzii.**
- Base of stipules obliquely oblong-lanceolate, 1·5–2 cm. long; appendage linear; leaflets lanceolate, about 2·3 cm. broad (*see* page 142, fig. 8) ..... 4. **Taubertiana.**

Leaf rachis and leaflets hairy :
- *Appendages of the stipules filiform or narrowly linear :-
  - Leaflets about 5–7 pairs, about 3 cm. broad, softly pubescent

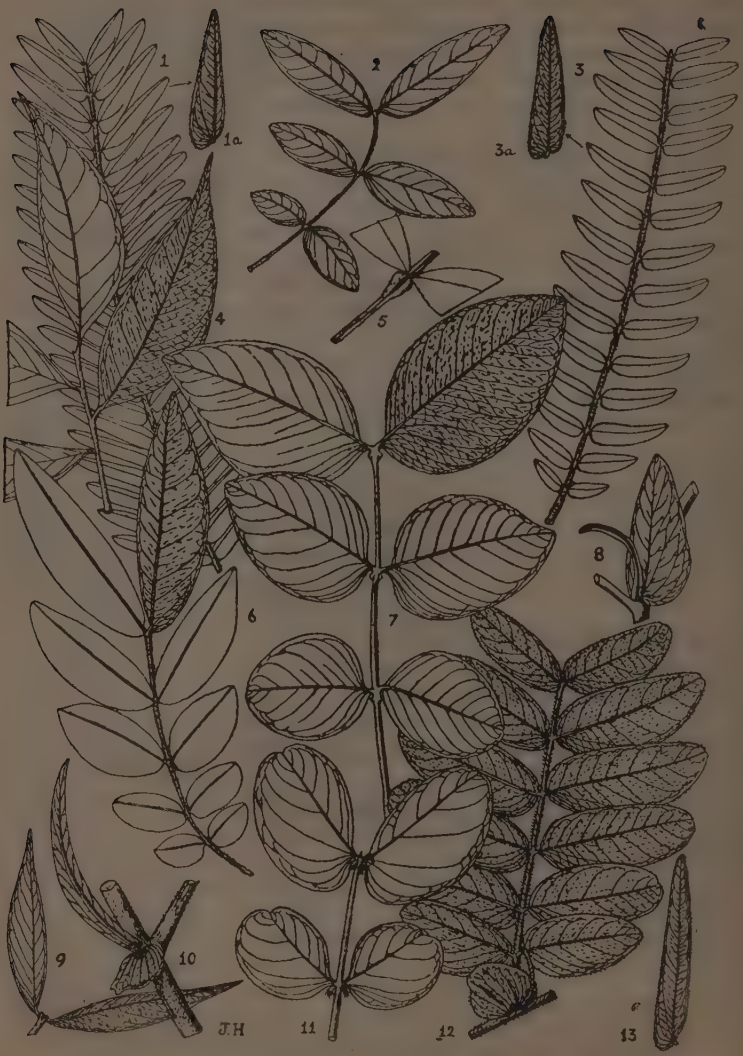

Fig. 1. *B. Wangermeeana* × $\frac{5}{8}$. Fig. 1a. leaflet of same, natural size. Fig. 2. *B. venosa* × $\frac{1}{2}$. Fig. 3. *B. reticulata*, natural size. Fig. 3a. leaflet of same, × 2. Fig. 4. *B. Klainei* × $\frac{1}{2}$. Fig. 5. *B. Randii*, showing rhachis winged below the leaflets, and developing into stipels; natural size. Fig. 6. *B. Lujae* × $\frac{1}{2}$. Fig. 7. *B. Hockii* × $\frac{1}{2}$. Fig. 8. *B. Taubertiana*, leaflet × $1\frac{3}{4}$. Fig. 9. *B. appendiculata*, terminal leaflet × $\frac{1}{2}$. Fig. 10. *B. Woodiana*, stipule × $1\frac{1}{2}$. Fig. 11. *B. Gairdnerae*, natural size. Fig. 12. *B. velutina*, × $\frac{1}{3}$. Fig. 13. *B. apertifolia*, leaflet × $\frac{1}{2}$.

beneath; stipules pubescent all over, with linear appendages; stipels absent (*see* page, 142, fig. 12)..... 5. **velutina.**

Leaflets about 12–25 pairs, less than 2 cm. broad:

Calyx about 1·5 cm. long; leaflets densely and softly tomentose beneath; stipels absent ..... 6. **Bequaertii.**

Calyx (where known) below 1 cm. long; leaflets rather sparingly pubescent beneath (tomentose in *B. Boehmii*):

Stipels present and conspicuous below the leaflets, the latter about 1·5 cm. broad, rounded or obtuse ..... 7. **Goetzei.**

Stipels absent:

Stipules glabrous; leaflets 1·5 cm. broad or more, emarginate, usually glabrous or subglabrous above except the midrib and margin ..... 8. **filiformis.**

Stipules pubescent or tomentose; leaflets about 1 cm. broad, acute or obtuse, more or less tomentose on both surfaces ..... 9. **Boehmii.**

Appendages of the stipules broadly linear-falcate, foliaceous, nearly as long as the internode; stipels absent; leaflets slightly pubescent, emarginate or rounded, about 1·5 cm. broad (*see* page 142, fig. 10).... 10. **Woodiana.

Section II. Caducae. Stipules deciduous before flowering or if slightly persistent then without a foliaceous base, but sometimes long and linear.

*Inflorescence branched:

†Leaflets 10 or more pairs:

‡Leaflets contiguous or with overlapping margins (*see* also *B. puberula*):—

§Leaflets over 4 mm. broad:

Midrib almost medial; leaflets

glaucous and finely reticulate below, 8–14 mm. long :
Calyx almost glabrous; leaflets glabrous; Congo and Rhodesia ..... 11. **glaucescens.**

Calyx distinctly velvety; leaflets minutely appressed pubescent; Angola ... 12. **Gossweileri.**

Midrib more or less near the margin; leaflets about 2·5 cm. long :
Inflorescence with about 8 lateral branchlets; leaflets about 10 pairs, glabrous ..... 13. **katangensis.**

Inflorescence mostly only slightly and shortly branched; leaflets 15–20 pairs, more or less pubescent :
Inflorescence with several spreading lateral branches, leaflets pubescent on both surfaces, mostly over 3 cm. long; midrib almost central; Tanganyika ..... 14. **flagristipulata.**

Inflorescence dense with few branches; leaflets under 3 cm. long; midrib towards the margin :
Leaflets almost 1 cm. broad, finely reticulate :
Leaflets broadest across the base, lanceolate and conspicuously narrowed to the obtuse apex (*see* page 142, fig. 1) ..... 15. **Wangermeeana.**

Leaflets broadest about the middle, more or less oblong, rounded at the apex ..... 16. **Wildemaniana.**

Leaflets 4–6 mm. broad, obtusely reticulate .... 17. **tamarindoides.**

§§Leaflets not more than 2 mm. broad :

Midrib central or nearly so, prominent below ; Tanganyika ..... 18. **microphylla.**

Midrib near the margin, prominent below ; Tanganyika 19. **taxifolia.**

Midrib quite inconspicuous, impressed below, sometimes slightly visible above ; Katanga and N.W. Rhodesia ..... 20. **mimosaefolia.**

Here also comes the imperfectly described species ..... 21. **pectinata.**

‡‡Leaflets not contiguous, usually remote from one another ; midrib more or less central :

Leaf-rhachis glabrous ; leaflets lanceolate, 4–8 cm. long, glabrous ..... 22. **longifolia.**

Leaf-rhachis pubescent :

Leaflets about 4 mm. broad :

Leaflets subequally cordate at the base ; Rhodesia and Portuguese E.Africa (*see* page 142, fig. 3) ..... 23. **reticulata.**

Leaflets rounded only on one side, very oblique on the other ; Tanganyika 24. **Fischeri.**

Leaflets about 1 cm. broad :

Leaf - rhachis distinctly pubescent ; leaflets laxly arranged :

Leaflets rounded and semicordate at the base, averaging about 4·5 cm. long (*see* page 142, fig. 13) ..... 25. **apertifolia.**

Leaflets narrowed on one side at the base, averaging about 3 cm. long :

Leaflets downy below, shortly pubescent to glabrescent on the margin ; bracteoles tomentellous ..... 26. **utilis.**

Leaflets pilose below with appressed hairs, and with bracteoles pilose ciliate on the margin ..... 26. **Mildbraedii.**

Leaf-rhachis minutely puberulous; leaflets almost contiguous ..... 28. **puberula.**

††Leaflets 8 pairs, oblong-lanceolate, about 7–8 cm. long; flowers in a dense panicle; calyx fulvous-tomentose; rhachis of leaf thinly pilose; Sierra Leone ..... 29. **leonensis.**

†††Leaflets 4–6 pairs; flowers in a lax panicle; S. Central and East Africa:

Leaflets oblong, rounded and conspiculously emarginate at the apex ..... 30. **Allenii.**

Leaflets oblong or ovate-lanceolate, narrowed to the apex:

Inflorescence glabrous; leaflets broadest towards the base, glabrous, about 5 cm. long, with very prominent nerves above, rounded at the apex... 31. **glaberrima.**

Inflorescence puberulous or pubescent:

Leaflets oblong-lanceolate, broadest towards the middle ..... 32. **angustistipulata.**

Leaflets ovate-lanceolate, broadest towards the base:

Leaflets glabrous, about 7–9 cm. long, obtusely pointed; calyx 7–8 cm. long ..... 33. **polyantha.**

Leaflets minutely puberulous towards the midrib, under 6 cm. long, emarginate; calyx about 5 mm. long or less ..... 34. **Bussei.**

††††Leaflets about 2–4 pairs (mainly West Africa):

‡Leaflets opposite, rounded, obtuse or slightly acuminate at the apex; inflorescence rather

dense-flowered; pedicels short:

Peduncle hairy:

Leaflets distinctly petiolulate, obliquely elliptic, acuminate, with few lateral nerves, shining; inflorescence borne on the young shoots, rusty-tomentellous; Cameroons 35. **cynometroides.**

Leaflets sessile:

Leaflets oblong-elliptic, rounded at the apex; inflorescence on the current season's growth, velvety-tomentose; Upper Guinea ..... 36. **eurycoma.**

Leaflets ovate-lanceolate, emarginate, minutely puberulous towards the midrib; inflorescence puberulous; Tanganyika 34. **Bussei.**

Leaflets more or less ovate, narrowed to the apex; inflorescence on the previous season's growth, rusty tomentose; Nyasaland ..... 37. **floribunda.**

Peduncle glabrous; inflorescence borne on the young shoots; leaflets sessile, falcately lanceolate or elliptic-lanceolate, obtuse, with numerous lateral nerves, shining; Cameroons ..... 38. **Zenkeri.**

‡‡Leaflets mostly alternate, long-acuminate, shining; inflorescence lax; pedicels long; Gaboon (*see* page 142, fig. 4) ... 39. **Klainei.**

**Inflorescence spiciform, unbranched or rarely with a short branch at the base:

†Bracteoles glabrous except the puberulous margin or rarely minutely and sparsely puberulous:

‡Leaf-rhachis or axis of inflorescence puberulous or pubescent:

Uppermost pair of leaflets oblong-lanceolate, about 6–8 cm. long, obtusely pointed :
Uppermost pair of leaflets about 3 times as long as the lowermost pair, distinctly acuminate with about 10 pairs of lateral nerves; inflorescence about 5 cm. long (*see* page 142, fig. 6) 40. **Lujae.**

Uppermost pair of leaflets about 2 times as long as the lowermost pair, emarginate, with about 6 pairs of lateral nerves; inflorescence under 3 cm. long (*see* page 142, fig. 2)..... 41. **venosa.**

Uppermost pair of leaflets obliquely obovate-elliptic, rounded and emarginate at the apex :
Uppermost pair of leaflets less than 4 cm. long; inflorescence about 2·5 cm. long; leaf-rhachis pilose ..... 42. **itoliensis.**

Uppermost pair of leaflets about 6 cm. long; inflorescence about 5 cm. long; leaf-rhachis minutely puberulous to glabrescent 43. **mpalensis.**

‡‡Leaf-rhachis and axis of inflorescence glabrous :
Pedicels stout, about 3 mm. long; flowers crowded; leaflets 2–3 pairs (*see* page 142, fig. 7)..... 44. **Hockii.**

Pedicels very slender, 5–8 mm. long; flowers laxly arranged; leaflets 4–5 pairs ..... 45. **Oliveri.**

††Bracteoles pubescent, puberulous or tomentose all over :
‡Leaf-rhachis pubescent :
Rhachis expanded but not developed into distinct stipels below the pairs of leaflets; Angola :
Uppermost pair of leaflets ovate; leaflets about 15 cm. long ..... 46. **spicaeformis.**

Uppermost pair of leaflets obliquely-elliptic, broadest above the middle; leaves about 8 cm. long or less ... 47. **Bakeriana.**

Rhachis winged below the 3–5 pairs of leaflets and usually expanded into distinct stipels (*see* page 142, fig. 5):

Leaflets 2–3 pairs, obliquely rounded and emarginate at the apex; Angola ..... 48. **obliqua.**

Leaflets 3–7 pairs, shortly pointed at the apex:

Inflorescence more or less pyramidal; leaflets 3–5 pairs ..... 49. **Randii.**

Inflorescence ellipsoid, dense-flowered; leaflets 6–7 pairs ..... 50. **Bragaei.**

‡‡Leaf-rhachis glabrous:

Leaflets 2-pairs; inflorescence about 12-flowered; bracteoles 8 mm. long (*see* page 142, fig. 11)..... 51. **Gairdnerae.**

Leaflets about 4 pairs or more; inflorescence many-flowered:

Leaflets obtuse or rounded at the apex and base; inflorescence not branched; stipels inconspicuous:

Leaflets elliptic-lanceolate, obtusely pointed; bracteoles distinctly pubescent 52. **edulis.**

Leaflets broadly obliquely elliptic, rounded and emarginate; bracteoles puberulous ..... 53. **euryophylla.**

Leaflets narrowed at both ends, acuminate at the apex; inflorescence with a lateral branch at the base; stipels prominent (*see* page 142, fig. 9) ..... 54. **appendiculata.**

Section 1. STIPULATAE.

1. **B. lufirensis** *De Wild* in Fedde Repert. 11: 512 (1913).

BELGIAN CONGO: Lufira River Valley, tree, fl. 6 Oct. 1911, *Hock* (type)!

PORTUGUESE E. AFRICA: without locality, *Stocks* 27a!

2. **B. stipulata** *De Wild.* in Ann. Mus. Congo Ser. IV. 44. t. XII (sub. nom. *B. appendiculata* De Wild., non Benth.) (1902).

Belgian Congo: Katanga Prov.; Lukafu, fl. 18 Aug. 1899, *Verdick* (type)!

Native Name: Sandwe (*Verdick*).

According to Verdick, the natives make cord from the bark.

3. **B. Holtzii** *Harms.* in Engl. Bot. Jahrb. 33: 154 (1902).

Tanganyika Territory: Dar-es-Salaam, fl. Nov. 1901, *Holtz* 31 (type)!

4. **Brachystegia Taubertiana** *Hutch. et B. Davy*, sp. nov.

Ramuli hornotini elongati, laxe foliati, circiter 3 mm. diametro glabri. *Alabastra* conica, circiter 5 mm. longa, puberula. *Folia* 12–15 cm. longa; rhachis glaber; foliola 3–4-juga, lanceolata, apice obtusa, emarginata, basi unilateraliter rotundata, usque ad 7 cm. longa et 2·3 cm. lata, chartacea, glabra; nervi laterales utrinsecus circiter 10, basales ascendentes; stipulae persistentes, basi foliaceae, oblongo-lanceolatae, obtusae, 1·5–2 cm. longae, 5–7 mm. latae, appendiculo lineare glabro; stipelae oblongo-ovatae, obtusae, circiter 1 mm. longae, glabrae. *Inflorescentia* breviter ramosa, circiter 5 cm. longa, fusco-tomentella; bracteae late ovatae, circiter 3 mm. longae. *Bracteolae* late ovatae. *Flores* juniores tantum visi.

Tanganyika Territory: Usambara; Doda, Feb. 1893, *Holst* 3023!

5. **B. velutina** *De Wild.* in Fedde Repert. 11: 512 (1913).

Belgian Congo: Elisabethville, 1911, *Hock* (type)! *Ringoet* 1916, *in Herb. Burtt Davy* 17784! Tschinsenda, about 1400 m., fl. Oct. 1912, *Rogers* 10371!

6. **B. Bequaertii,** *De Wild.* in Fedde Repert. 11: 512 (1913).

Belgian Congo: Sankisia, a small tree in the Savannah, *Bequaert* 211 (type)!

Angola: between the Kusaba and Kunene Rivers, fr. Feb. 1907, *Gossweiler* 2867 (in part, *in Herb. Mus. Brit.*)!

Native Name: Samba (*Gossweiler*).

7. **B. Goetzei** *Harms.* in Engl. Bot. Jahrb. 30: 318, t. xiii (1901).

Tanganyika Territory: Unyika; near Dorf Piseki, Buschwald at 1400 m., fl. Nov. 1899, *Goetze* 1423 (type)!

Native Name: nGuanzo.

8. **Brachystegia filiformis** *Hutch. et B. Davy*, sp. nov.

Arbor parva; ramuli annotini circiter 5 mm. diametro, leviter sulcati, breviter et molliter pubescentes, hornotini straminei, internodiis 4–5 cm. longis. *Alabastra* lateraliter compressa, anguste ovoidea, tomentella, 4–5 mm. longa. *Folia* 20–30 cm. longa; rhachis supra canaliculatus, molliter et breviter pubescens, infra foliola leviter elevatus; foliola 12–18-juga, opposita vel rare subopposita, lanceolato-oblonga, emarginata, basi inaequaliter cordata, 3·5–5 cm. longa, 1·2–1·5 cm. lata, coriacea, costa media utrinque parce pubescente excepta glabra,

infra pallidiora, subglauca, ciliolata; nervi laterales utrinsecus 6–8, basales ascendentes, superiores patuli, omnibus intra marginem distincte conjunctis; stipulae basi foliaceae et reniformes, circiter 1·5 cm. latae, undulatae vel irregulariter dentatae, glabrae, nervosae, appendiculo filiforme circiter 1·5 cm. longo rubescente; stipelae 0. *Flores* non visi. *Legumen* (incompletum tantum visum) durum, circiter 3·5 cm. latum, glabrum.

Rhodesia: N.W. Rhodesia; Broken Hill, about 1250 m., Nov. 1909, *Rogers* 8605 (type)! S. Rhodesia; Haroni River about 1800 m., fr. Sept. 1906, *Swynnerton* 1028! Victoria Falls, in sandveld, *Burtt Davy* 17831!

Native Names: umBfuti (Chindao), amaChibero (Mashona); mBombo (Chilundi) mooSamba (Chikaundi and Chinyanja), Mumbu (Kota Kota).

According to Swynnerton this is a small tree with fibrous bark used as cord.

9. **B. Boehmii** *Taub.* in Engl. Pfl. Ost. Af. C: 197 (1895).

Tanganyika Territory: Lake District; Pori near Igonda, *Boehm* 159a (type)!

Nyasaland: Mlanje, 950–1800 m., fl. Oct. 1905, *Purves* 194!

Rhodesia: S. Rhodesia; Haroni R. at about 1650 m. *Swynnerton* 1028!

Native Name: mJombo (*Purves*), umBfuti (Chindao).

According to Purves this is a small tree 20–30 ft. high, the inner bark of which is used for making cloth. Swynnerton also states that it is a small tree with fibrous bark used as cord.

10. **B. Woodiana** *Harms* in Engl. Bot. Jahrb. 30: 82 (1901).

B. oblonga Sim., For. Fl. Port. E. Afr. 49 (1909)?

Tanganyika Territory: Keegwah, about 1300 m. lat. 5° 5′ S., long. about 32° E., *Speke and Grant* 1!

Nyasaland: *Buchanan in Herb. Wood* 6960 (type)! Njombo, *Buchanan* 334 in *Herb. Mus. Brit.*!

Portuguese East Africa: Quelimane; Magenja da Costa, and around Arenga, a common medium-sized tree, *Sim.* 5574 (not seen).

Rhodesia: S. Rhodesia; Salisbury, a fine tree, *Rand* 554!

Native Names: Mecombo (*Speke & Grant*), Modi (*Sim*) Machabel (*Rand*).

According to Speke & Grant it is a common forest tree up to 50 ft. high, with few branches and "sensitive leaves"; the bark is converted into boats, corn-bins, roofing lashings, baskets, kilts for wear, mats, etc.; the timber is of little value, but is used for rafters in buildings. Sim states that the bark is used for the same purposes as that of "*B. spicaeformis*" (*B. Bragaei*?). The pods are a favourite food of the elephant (*Rand*)—A sucker-shoot of a tree from Elisabethville (*Burtt Davy* 18017!), where it is known as "mooSaamba makooba," may represent this species.

Section II. Caducae.

11. **Brachystegia glaucescens** *Hutch. et B. Davy.* sp. nov.

Arbor patula circiter 6·5 m. alta; ramuli annotini circiter 3 mm. crassi, glabri, lenticellati, hornotini breviter virgati, dense fulvo-pubescentes. *Folia* 5–9 cm. longa; rhachis pubescens; foliola imbricata, 14–18-juga, anguste oblonga, utrinque rotundata, 0·8–1·4 cm. longa, circiter 4 mm. lata, glabra, reticulata, glauca; stipulae caducae; stipelae 0. *Inflorescentia* paniculata, 2·5–3 cm. longa; axis fulvo-pubescens. *Bracteolae* obovatae, apice rotundatae, 5 mm. longae, 3·5 mm. latae, breviter fulvo-pubescentes. *Sepala* 5, parva, inaequalia, late obovata, ciliata, maxima circiter 2 mm. longa. *Ovarium* stipitatum, fulvo-hirsutum. *Fructus* non visus.

Belgian Congo: Katanga Prov.; Elisabethville, *Ringoet in Herb. Burtt Davy* 17785!

Rhodesia: S. Rhodesia; Umtali Div., 1915, *Teague* 300 (type)! Makoni Dist. about 1600 m., a spreading tree 20 ft. high, fl. July 1917, *Eyles* 813! Matoppo Hills, about 1600 m., a large tree, fl. Oct. 1903, *Eyles* 1250!

12. **Brachystegia Gossweileri** *Hutch. et B. Davy*, sp. nov.

Arbor usque ad 24 m. alta, trunco circiter 60 cm. diametro; ramuli annotini breves, pubescentes, striati, hornotini fulvo-pubescentes, canaliculati. *Folia* 5–7 cm. longa; rhachis pubescens, infra foliola incrassatus, sulcatus; foliola circiter 15-juga, imbricata, oblongo-lanceolata, apice obtusa, basi inaequaliter truncato-rotundata, circiter 15 mm. longa et 4–5 mm. lata, utrinque minute pubescentia, cinereo-glauca; stipulae deciduae; stipelae 0. *Inflorescentia* dense paniculata, 3·5–5 cm. longa, ubique breviter fusco-pubescens; bracteae late ovatae, circiter 2 mm. longae. *Bracteolae* oblongo-obovatae, circiter 6 mm. longae. *Sepala* 5, subaequalia, ovata, circiter 2 mm. longa, ciliata. *Ovarium* breviter stipitatum, dense hirsutum.

Angola: near Fort Princess Amelia, between Coconda and Cubango, right bank of Cubango River, a common tree up to 80 ft. high by 3 ft. diameter, forming extensive woods, fl. Sep. 1905, *Gossweiler* 2025 (type)!

Native Name: Lamba, or Samba ? (*Gossweiler*).

13. **B. katangensis** *De Wild.* in Ann. Mus. Congo, Ser. IV: 204 (1903).

Belgian Congo: Katanga Prov.; Lukafu, fl. Oct. 1899, *Verdick* 117 (type)!

Native Name: Kisamba-Kwe-Kwe.

14. **B. flagristipulata** *Taub.* in Engl. Pfl. Ost. Af. C: 198 (1895).

Tanganyika Territory: Usaramo, 1894, *Stuhlman* 6400 (type)!

Nyasaland: Lake Nyasa, in fr. only, *Archdeacon W. P. Johnson* 313! (probably belongs here).

15. **B. Wangermeeana** *De Wild.* in Fedde Repert. 11: 513 (1913).

Belgian Congo: Katanga Prov.; Elisabethville, 1911, *Hock* (type)!

6. **B. Wildemaniana** *R. E. Fries* in Wiss. Ergeb. Schwed. Rhod.-Kongo-Exped., 1911–12, 1 : 68 (1914).

Rhodesia : N.E. Rhodesia; Malolo–Katewe between Lakes Bangweolo and Tanganyika, fl. Nov. 1911, *R. E. Fries* 1204 (type)!

17. **B. tamarindoides** *Welw. ex Benth.* in Trans. Linn. Soc. 25 : 312 (1866).

Angola : Huilla; between Lopollo and the lake of Ivantala, common, occasionally constituting little woods, fl. Oct. 1859, young fr. Feb. 1860, *Welwitsch* 585 (type)!; wooded places on the banks of the river Cacolabar, *Welwitsch* 585b! 4157! Kubango, right bank of the river near the Fort Princess Amelia, fl. Oct. 1905, *Gossweiler* 2136! Malange Distr., *Gossweiler* 1352!

Belgian Congo : Katanga Prov., near Elisabethville, fr. Aug. 1919, *Burtt Davy* 17845! 18016!

Native Name : mooSaamba kiloko.

String is prepared from the bark (*Burtt Davy*).

18. **B. microphylla** *Harms* in Engl. Bot. Jahrb. 28 : 397 (1900).

Tanganyika Territory : Uhehe, *Goetze* 603 (type)! Muena Plateau, tree up to 40 m. high, fr. 14 June 1903, *Busse* 2867! Without locality, *Busse* 190!

19. **B. taxifolia** *Harms* in Engl. Bot. Jahrb. 33 : 155 (1902).

Tanganyika Territory : between Gominyi and Bueni, *von Prittwitz and Gaffron* 54 (type)!

20. **Brachystegia mimosaefolia** *Hutch. et B. Davy*, sp. nov.

Arbor circiter 6·5 m. alta; ramuli annotini circiter 3 mm. diametro, molliter hispidi, hornotini breviter fulvo-villosi. *Folia* 5·5–6·5 cm. longa; rhachis laxe pilosus, inter foliola anguste expansus; foliola imbricata, circiter 25-juga, oblique lanceolata, apice obtusa basi rotundata, circiter 1 cm. longa, et 0·2 cm. lata, discoloria, utrinque minute pubescentia et ciliolata, costa fere marginale utrinque elevata; stipulae deciduae, basi biauriculatae et foliaceae, circiter 3 mm. longae, appendiculo lineare 1 cm. longo pubescente et margine fimbriato; stipelae 0. *Inflorescentia* subsessilia, parce ramosa, 1·5–3 cm. longa, late triangularia; bracteae late ovatae, 2·5–3 mm. longae, pubescentes, striatae. *Bracteolae* obovato-ellipticae, coriaceae, circiter 9 mm. longae et 3–4 mm. latae, molliter pubescentes. *Sepala* 5, fere orbicularia, usque ad 3 mm. longa, interdum bilobata, ciliata. *Ovarium* stipitatum, fulvo-villosum. *Legumen* (incompletum tantum visum) lignosum, circiter 3 cm. latum, glabrum.

Rhodesia : N.W. Rhodesia; Broken Hill, about 1300 m., fl. Sep. 1909, *Rogers* 8552 (type)!

Belgian Congo : Katanga Province; Mokambo, near Elizabethville, about 830 m., an ornamental tree with umbrella-shaped head, common, fr. 3 Aug. 1919, *Burtt Davy* 18004! 17802b!

Native Name : nGanza (Katanga).

21. **B. pectinata** *Sim*, For. Fl. & For. Resources of Port. E. Afr. 50 (1909).

Portuguese E. Africa: Quelimane; Magenja da Costa and Nhamacurra, not common, tree about 60 ft. high, with straight, clean, white stem ,and densely pubescent twigs and rhachis, *Sim* 6099 (type)—not seen.

22. **B. longifolia** *Benth.* in Hook. Ic. Pl. 14: t. 1359 (1881).

Nyasaland: Shire Highlands, *Buchanan* 22 (type)! 217 (in part, *Herb. Mus. Brit.*)!

Native Name: nJombo.

Buchanan calls it a "Bark-cloth tree" and states that the wood is very soft.

23. **Brachystegia reticulata** *Hutch. et B. Davy*, sp. nov.

Arbor patula circiter 6·5 m. alta; ramuli virgati, parce puberuli et distincte lenticellati, hornotini molliter pubescentes, circiter 1–5 mm. diametro. *Alabastra* conica, 5–6 mm. longa, pubescentia. *Folia* 7–9 cm. longa; rhachis pubescens, infra foliola incrassato-expansus; foliola circiter 15-juga, circiter 0·5 cm. discontigua, lanceolata vel oblongo-lanceolata, obtuse rotundata, inaequaliter cordata, circiter 1·4 cm. longa et 4 mm. lata, glabra et prominenter reticulata; stipulae deciduae; stipelae 0. *Inflorescentia* paniculata, laxe ramosa, pauciflora, circiter 4 cm. longa; axis fulvo-pubescens; bracteae deciduae, ovatae, pubescentes. *Bracteolae* late oblongo-obovatae, 4 mm. longae, 2·5–3·5 mm. latae, pubescentes. *Sepala* 5, subaequalia, oblongo-ovata, obtusa, 2 mm. longa, minute et parce ciliolata. *Ovarium* breviter stipitatum, dense hirsutum. *Legumen* lignosum, circiter 11 cm. longum et 3·5 cm. latum, glabrum.

Rhodesia: S. Rhodesia; Umtali Div., Odzani River Valley, 1915, *Teague* 299 (type)! At umTegesi's village on the Kootooro River, a branch of the Sabi, fr. July 1870, *Baines*! Makoni Distr., about 1500–1560 m. spreading tree 20 ft., fr. July 1917, *Eyles* 813! The following specimens probably belong here:—

Portuguese East Africa: Moramballa, about 1000 m., *Kirk*!; Gazaland, Madanda Forest, about 120 m., *Swynnerton* 1026!

24. **B. Fischeri** *Taub.* in Engl. Pfl. Ost. Afr. C: 197 (1895).

Tanganyika Territory: Usuri, *Fischer* 148 (type)!

The following imperfect specimen may belong here: Portuguese East Africa; Madanda forests, common at Amsate, about 130 m., fr. Dec. 1906, *Swynnerton* 1026! native name, Munzi (Chindao).

25. **Brachystegia apertifolia** *Hutch. et B. Davy*, sp. nov.

Arbor patula 6·5–10 m. alta; ramuli annotini circiter 3 mm. diametro, lenticellati, molliter pubescentes, hornotini striati, pubescentes. *Folia* 15–20 cm. longa; rhachis sulcatus; foliola circiter 8-juga, 1·5–2 cm. discontigua, oblongo-linearia, apice rotundata, inaequaliter truncata, inaequilonga, inferiora circiter 2 cm. longa et 0·7 cm. lata, intermedia circiter 5 cm. longa et

1 cm. lata, superiora circiter 4·5 cm. longa et 1 cm. lata, utrinque parce pubescentia, ciliolata, venosa; nervi laterales utrinsecus circiter 6–9, basales ascendentes, cum ceteris prominenter conjuncti; stipulae deciduae; stipelae minutae. *Inflorescentia* laxe paniculata, circiter 5 cm. longa; axis pubescens. *Bracteolae* oblongo-obovatae, circiter 5 mm. longae et 3·5 mm. latae, puberulae. *Sepala* 5, subaequalia, oblonga, ciliata. *Ovarium* stipitatum strigoso-hirsutum.

Belgian Congo: Dilolo, June 1908, *Sapin*!

Nyasaland: nTondwe, 1905, *Cameron* 134 (type)!

Angola: Pedras de Guinga, between Condo and Quisonde, fr. March 1857, *Welwitsch* 571! May belong here.

Native Name: mooZamba (*Welwitsch*).

26. **Brachystegia utilis** *Hutch. et B. Davy*, sp. nov.

Arbor alta vel circiter 6·5–10 m. alta; ramuli annotini pubescentes, circiter 2 mm. crassi, hornotini fulvo-pubescentes. *Alabastra* anguste conica, circiter 5 mm. longa, puberula. *Folia* 8–15 cm. longa; rhachis hirsutus, canaliculatus, inter foliola anguste expansus; foliola plerumque discontigua, rare subcontigua, 8–9-juga, oblique oblonga ad lanceolato-oblonga, apice rotundata vel emarginata, basi inaequaliter rotundata, 2–4 cm. longa, 0·7–1·5 cm. lata, leviter discoloria, utrinque distincte reticulata et parce pubescentia; stipulae deciduae, intrapetiolares, filiformes, circiter 8 mm. longae, pubescentes; stipelae 0. *Inflorescentia* ramosa, densiflora, 4–10 cm. longa; axis dense fulvo-pubescens; pedicelli usque ad 3 mm. longi; bracteae parvae, caducae. *Bracteolae* 5 mm. longae, 3·5 mm. latae, brevissime pubescentes. *Sepala* 5, parva, subaequalia, ciliolata. *Ovarium* sessile, dense hirsutum. *Legumen* lignosum, 6 cm. longum, 2·5 cm. latum, glabrum. *Semina* oblongo-elliptica, circiter 1·5 cm. longa et 1 cm. lata.

Nyasaland: Mlanje, about 1000 to 1600 m., a small tree 20–30 ft., fl. Oct. 1905, *Purves* 193 (type)! without precise locality, *Buchanan* 217! Zomba and vicinity about 800 to 1250 m. a tall tree, fl. Dec. 1896, *Whyte*!

Portuguese East Africa: Mozambique Territory; Mossurizi, up to 1300 m., a sturdy, much-branched tree, common all over, fr. Feb. 1907, *W. H. Johnson* 105!

Belgian Congo: Katanga Province; Kimbaëmbe River near Elisabethville, fr. Aug. 1919, *Burtt Davy* 17962!

Angola: Huilla; between Mumpulla and Nene, a small tree about 8 ft. high, with the habit, nearly, of a Pistacia, occurring sparingly in forests of Eugenia, Proteaceae, etc., *Welwitsch* 584!

Native Names: Nangwesu (Mlanje); mooSaamba (Katanga).

According to Purves this is one of the bark-cloth trees; in Katanga Province string is obtained from the bark (*Burtt Davy*).

27. **B. Mildbraedii** *Harms* in Notizbl. Bot. Gart. Berlin 8: No. 72: 151 (1922).

Cameroons: near Makalat, between Bipindi and Ebolowa, fl. Dec. 1913, *Mildbraed* 7581 (type)!

28. **Brachystegia puberula** *Hutch. et B. Davy*, sp. nov.

Arbor patula, circiter 12 m. alta; ramuli annotini glabri, lenticellati, 3 mm. crassi, hornotini minute puberuli et striati. *Folia* circiter 15 cm. longa; rhachis minute puberulus, canaliculatus, infra leviter expansus; foliola 10–12-juga, oblonga, apice rotundata, leviter emarginata, basi subaequaliter rotundata 2·5–3·5 cm. longa, 1–1·5 cm. lata, chartacea, utrinque minute puberula; nervi laterales inconspicui; stipulae deciduae; stipelae 0. *Inflorescentia* paniculata, densiflora, circiter 5 cm. longa, ubique fusco-puberula; pedicelli 1·5 mm. longi. *Bracteolae* oblongo-obovatae, circiter 5 mm. longae et 3 mm. latae. *Sepala* 5, late oblonga, 2 mm. longa. *Ovarium* stipitatum, parce pubescens.

Angola: Between the Kusaba and Kunene rivers, a common tree extending from the Kakonda to the river Kueve, fl. Feb. 1907, *Gossweiler* 2867 in part, (*Herb. Mus. Brit.*)!

Native Name: Samba.

29. **Brachystegia leonensis** *Hutch. et B. Davy*, sp. nov.

Arbor excelsa usque ad 30 m. alta; ramuli annotini glabri, circiter 3 mm. diametro, hornotini glabrescentes. *Alabastra* parva et inconspicua. *Folia* circiter 25 cm. longa; rhachis subteres, parce pilosus; foliola 8–11-juga, contigua, oblongo-lanceolata leviter falcata, ad apicem obtusum leviter angustata, basi aequaliter obtusata, 7–8 cm. longa, 2–2·5 cm. lata, papyracea, supra glabra et nitida, infra costa media prominente rufo-pilosa excepta glabra; nervi laterales utrinsecus 8–10, utrinque distincti; stipulae deciduae; stipelae 0. *Inflorescentia* paniculata, densiflora, 7 cm. longa, ubique rufo-tomentella; bracteae late ovatae. *Bracteolae* oblongae, 1·4 cm. longae, 0·4 cm. latae. *Sepala* subaequalia, late obovato-rotundata, circiter 3 mm. longa, dentata. *Ovarium* stipitatum, hirsutum. *Legumen* non visum.

Sierra Leone: Kambui, tree 100 ft. high, fl. March 1914, *Lane-Poole* 188!

Native Name: Bodgei.

Lane-Poole notes that the tree exudes a brown resin.

30. **Brachystegia Allenii** *Hutch. et B. Davy*, sp. nov.

Arbor magna, patula; ramuli annotini glabri longitudinaliter striati, circiter 3 mm. crassi, hornotini glabri, striati. *Folia* 10–14 cm. longa; rhachis glaber, sulcatus, inter foliola anguste expansus; foliola discontigua, 4–5-juga, oblique oblonga, apice profunde emarginata, basi inaequaliter truncato-rotundata, circiter 2·5–4·5 cm. longa, 1·5–2 cm. lata, leviter coriacea, utrinque prominenter reticulata et glabra; costa media elevata sulcata; nervi laterales utrinsecus 6–8, basales ascendentes, superiores patuli, omnes intra marginem distincte conjuncti; stipulae deciduae, basi foliaceae et reniformes circiter 0·4 cm. latae, glabrae, reticulatae, appendiculo filiforme circiter 1 cm. longo rubescente parce ciliato; stipelae 0. *Inflorescentia* laxe ramosa, 4–5 cm. longa, 4 cm. lata; axis glaber; pedicelli usque ad 1 mm. longi; bracteae 2 mm. longae, ovatae, glabrae, ciliolatae, deciduae. *Bracteolae* oblongo-rotundatae 5–6 mm. longae,

3·5 mm. latae, glabrae, striatae. *Sepala* 5, inaequalia, fimbriata, maxima circiter 3 mm. longa. *Ovarium* stipitatum, dense hirsutum. *Legumen* lignosum, 12 cm. longum, 3·5–4 cm. latum, glabrum.

Portuguese East Africa : Sandy hills at mouth of mSala River, fl. Nov. 25, 1911, *Allen* 93 (type)!

Tanganyika Territory : Saliman-Mamba, fr. 6 June 1903, tree 12–18 m. high, *Busse* 2780.

According to Allen the bark is used to make native river craft.

31. **B. glaberrima** *R. E. Fries* in Wiss. Ergeben. Schwed. Rhod.-Kongo-Exped. 1911–12. 1 : 66 (1914).

Rhodesia : N.E. Rhodesia; Mporokoso, between Lakes Bangweolo and Tanganyika, fl. 31 Oct. 1911, *R. E. Fries* 1177 (type) ! Miali, near Lake Bangweolo, *R. E. Fries* 1065 !

32. **B. angustistipulata** *De Wild.* in Fedde Repert. 11 : 511 (1913).

Belgian Congo : Katanga Prov.; Sankisia, a tall tree in bush-savannah, *Bequaert* 165 (type) !

33. **B. polyantha** *Harms* in Engl. Bot. Jahrb. 30 : 319 (1901).

Tanganyika Territory : Untali, Kivira-Thal, about 1400 m., fl. Nov. 1899, *Goetze* 1478 (type) !

34. **B. Bussei** *Harms* in Engl. Bot. Jahrb. 33 : 155 (1902).

Tanganyika Territory : Ungoni; Mampyui Road, fl. Decem. 1900, *Busse* 729 (type) !

35. **B. cynometroides** *Harms* in Engl. Bot. Jahrb. 26 : 267 (1899).

Cameroons : Lolo Stationsberg, fl. Jan. 1895, *Staudt* 10 (type) ! Bipinde, 1907, *Zenker* 3390 ! Bipinde 1908, *Zenker* 3640 !

36. **B. eurycoma** *Harms* in Engl. Bot. Jahrb. 49 : 424 (1913).

Cameroons : Dodo, about 700 m., tree 20–30 m. high, fl. March, 1909, *Ledermann* 2905 (type) ! Ebendort, *Ledermann* 2990.

S. Nigeria : Yoruba, fl. April 1890, *Millson !*

Native Name : Akolodo (Yoruba).

Millson states that it yields a gum.

37. **B. floribunda** *Benth.* in Hook. Ic. Pl. 14 : 43 (1881).

Nyasaland : Shire Highlands, *Buchanan* 10 (type) ! 11 !

38. **B. Zenkeri** *Harms* in Engl. Bot. Jahrb. 45 : 298 (1910).

Cameroons : Bipinde, 1908, *Zenker* 3695 (type) !

39. **B. Klainei** *Pierre ex Harms* in Engl. Bot. Jahrb. 40 : 30 (1907).

Gabon : near Libreville, tree 12–28 m., *Klaine* 8 (type) ! 3260 ! 3319 !

Angola : forest on the banks of the River Luali, at Belize, Dec. 1918, *Gossweiler* 7615 !

40. **B. Lujae** *De Wild.* MSS.

Ramuli annotini minute puberuli ad glabrescentes, 3 mm. diametro, minute lenticellati, purpureo-brunnei, hornotini leviter

elongati, breviter pubescentes. *Alabastra* minuta, pubescentia. *Folia* 13–15 cm. longa; rhachis pubescens, infra foliola dilatatus, sulcatus; foliola 5-juga, valde inaequalia, inferiora elliptico-oblonga, 2 cm. longa, 1 cm. lata, tenuiter papyracea, superiora late-oblique lanceolata, ad apicem obtusum breviter angustata, unilateraliter anguste rotundata, 7·5 cm. longa, 2·5 cm. lata, utrinque costa media puberula excepta glabra; nervi laterales numerosi, prominuli, basales ascendentes; stipulae caducae; stipelae 0. *Inflorescentia* spiciformis, circiter 5 cm. longa, 3 cm. lata; axis fere glaber; bracteae caducae; pedicelli graciles, circiter 7 mm. longi, glabri. *Bracteolae* obovato-oblongae, glabrae, striatae, circiter 7mm. longae et 3mm. latae. *Sepala* minuta, lineari-lanceolata. *Ovarium* breviter stipitatum, ferrugineo-hirsutum.

Belgian Congo: Forest of the Sankuru, fl. Aug. 1902, *Luja* 51!

41. **Brachystegia venosa** *Hutch. et. B. Davy*, sp. nov.

Arbor circiter 9 m. alta; ramuli annotini glabrescentes, circiter 3 mm. crassi, striati, hornotini molliter pubescentes. *Alabastra* late conica, 0·5–1·3 cm. longa, puberula, squamis ciliolatis. *Folia* circiter 1 cm. longa; rhachis molliter pubescens, sulcatus, infra foliola late expansus; foliola valde discontigua, 3–4-juga, oblique oblongo-lanceolata, apicem versus leviter angustata, emarginata, base inaequaliter rotundata, inferiora 2–2·5 cm. longa, 1–1·3 cm. lata, superiora 4–6·5 cm. longa et 1·5–1·7 cm. lata, chartacea, conspicue venosa, costa media puberula excepta glabra; nervi laterales utrinsecus circiter 6, supra conspicui, basales ascendentes; stipulae deciduae; stipelae rhachidis apicem versus plerumque evolutae, paxilliformes. *Inflorescentia* spiciformis, pauciflora, circiter 2·5 cm. longa; axis puberulus; pedicelli graciles, circiter 3 mm. longi, puberuli. *Bracteolae* elliptico-obovatae, 6 mm. longae, 3·5 mm. latae, fere glabrae. *Sepala* 2, lanceolata, ciliolata, 1–1·5 mm. longa, vel 0. *Ovarium* stipitatum, hirsutum. *Legumen* non visum.

Uganda: Stevenson Road, fl. Nov., *Scott Elliot* 8380! 8389 in *Herb. Mus. Brit.*!

Rhodesia: N.W. Rhodesia; Highveld near the Victoria Falls, erect tree 30 ft. high, fl. Sep. 1905, *Allen* 165 (type)!

42. **B. itoliensis** *Taub.* in Engl. Pfl. Ost. Afr. C: 197 (1895).

Tanganyika Territory: Victoria Nyanza; Itolio, fl. Nov. 1890, *Stuhlmann* 925 (type)!

43. **B. mpalensis** *Micheli* in Compt. Rend. Soc. Bot. Belg. 36: 73 (1897); Illustr. Fl. Cong. t. LXXXVIII.

Belgian Congo: m'Pala, *Descamps* 27 (type)! m'Towa, fl. Aug. 1895, *Descamps!*

Rhodesia: N.W. Rhodesia; Chilanga, fl. Sep. 1909, *Rogers* 8451! Broken Hill about 1300 m., *Rogers* 8608! S. Rhodesia; Victoria, *Munro* 330!

According to Descamps this is a large tree, the wood of which is excellent for constructive purposes. The bark is used as a remedy for coughs (*Rogers*).

Native Names: Kapootoo (Chinyanja), Mapootoo (Chikaundi), mPutchi (Chilumda), teste Rogers.

44. **B. Hockii** *De Wild.* in Fedde Repert. 11: 512 (1913). *B. Hockii* var. *papyracea* De Wild, MSS. *B. trijuga* R. E. Fries in Wiss. Ergeb. Schwed. Rhod.–Kongo–Exped. 1911–12, 1: 65, t. 9, fig. 1 (1914.) *B. mpalensis* var. *latifoliata* De Wild. Etud. Fl. Katang. 45 (1902).

Belgian Congo: Katanga, 1911, *Hock* (type)! near Lukafu, fl. Aug. 1899, *Verdick* 64! Sankesia, fl. Aug. 1911, *Bequaert* 170! Elisabethville, fr. Aug. 1919, the predominant tree, *Burtt Davy*, 17815! 17966!

Angola: Malange District, *Gossweiler* 1324! 1337! Kubango, *Gossweiler* 1911; River Kutchi, *Gossweiler* 3370!

Rhodesia: N.E. Rhodesia; between the Luapula and Luera Rivers; fl. Sep. 1911, *R. E. Fries* 586! Meali, near Lake Bangweolo Oct. 1911, *R. E. Fries* 1068! N.W. Rhodesia; Bwana Makubwa Aug. 1911, *R. E. Fries* 321! S. Rhodesia; Victoria Falls, in sandveld, *Burtt Davy* 17835!

Native Names: Mookootu (*Verdick*), Kapootoo (*Burtt Davy*), Mushovi (*Gossweiler*).

The type of *B. Hockii* is a bad, scale-infested specimen.

45. **B. Oliveri** *Taub.* in Pfl. Ost. Afr. C: 197 (1895).

Kenya Colony: Mombasa, *Wakefield* (type)!

46. **B. spicaeformis** *Benth.* in Trans. Linn. Soc. 25: 312 (1866).

Angola: Huilla, *Welwitsch* 579 (type)! 578! 617! 580 (in *Herb. Mus. Brit.*) 583! 575! Kubango, woods of Fort Princess Amelia, *Gossweiler* 1965! 3846! in *Herb. Mus. Brit.*! and without definite locality 1809! Lubango, side of the high plateau, in open country about 2000 m., an umbrella-shaped tree 9 m. high, with spreading branches, the pods nearly all at the top showing above the leaves, fr. May 1909, *Pearson* 2650!

Belgian Congo: Katanga Prov.; near Elisabethville, *Burtt Davy* 17850!

Native Name: Moobanda (*Gossweiler*), Kapootoo (*Burtt Davy*).

47. **Brachystegia Bakeriana** *Hutch. et B. Davy*, sp. nov.

Arbor decidua, 8 m. alta; ramuli annotini glabri, inconspicue lenticillati, circiter 1·5 mm. crassi, hornotini breves, breviter pilosi, demum glabrescentes. *Folia* 3·5–6 cm. longa; rhachis parce pilosus, infra foliola leviter expansus; foliola discontigua, 2–3-juga, obliquissime oblongo-elliptica, emarginata, unilateraliter rotundata, terminalia 2–3·5 cm. longa, 1·5–2 cm. lata, chartacea, cinereo-glauca, glabra, reticulato-venosa; stipulae deciduae; stipelae 0. *Inflorescentia* spiciformis, densiflora, circiter 2·5–3 cm. longa; bracteae non visae; axis dense pubescens; pedicelli graciles, ad 4 mm. longi, pubescentes. *Bracteolae* late obovato-oblongae, circiter 7 mm. longae, 3·5 mm. latae, pubescentes.

Sepala nulla. *Tubus staminalis* usque ad 4 mm. longus. *Ovarium* stipitatum, pubescens. *Legumen* lignosum, oblongum, truncatum, 9 cm. longum, 3 cm. latum, glabrum. *Semina* circiter 1·5 cm. longum et ultra 1 cm. latum.

Angola : Ganguella country, east of Kubango River, fl. June 1906, *Gossweiler* 2595 (type) ! a deciduous tree up to 25 ft. high; left bank of River Cumassa, a tributary of the Quembo, fl. Aug. 1906, *Gossweiler* 2652 !

Native Names : Mutete, Mushobi, mooAngombe (*Gossweiler*)

Named in compliment to Mr. E. G. Baker of the Botanical Department, British Museum.

48. **Brachystegia obliqua** *Hutch. et B. Davy*, sp. nov.

Arbor usque ad 8 m. alta; truncus circiter 13 cm. diametro; ramuli annotini pubescentes, lenticellati, circiter 2·5 mm. crassi, hornotini dense fulvo-pubescentes. *Folia* 5–8 cm. longa; rhachis pubescens, supra canaliculatus; foliola 3-juga, discontigua, obliquissime oblongo-elliptica, emarginata, basi unilateraliter rotundata, terminalia 3–4 cm. longa, 1·5–2·3 cm. lata, chartacea vel subcoriacea, utrinque breviter pubescentia, demum fere glabra, adulta conspicue reticulata; nervi laterales numerosi, basales ascendentes prominentes; stipulae deciduae; stipelae prominentes, paxilliformes, ad 2 mm. longae, pubescentes. *Inflorescentia* spiciformis, densiflora, fusco-pubescens vel subtomentosa; bracteae lineares, 4–5 mm. longae; pedicelli 3 mm. longi. *Bracteolae* obovato-ellipticae, circiter 7 mm. longae. *Sepala* lineari-lanceolata, ciliata, ad 2 mm. longa. *Tubus staminalis* 4 mm. longus. *Ovarium* stipitatum, pubescens.

Angola : between T'Chirandongombe and River Longa, fl. June 1906, *Gossweiler* 2711 (type) ! T'Chancambe, in mixed woods, fl. Aug. 1906, an evergreen tree up to 35 ft. high, *Gossweiler* 2640 ! between Cotoso and Cavange, in the denser secondary woods, fl. Aug. 1905, *Gossweiler* 1902, between Simbola Candingo and Kubango, fl. Oct. 1905, *Gossweiler* 2151 !

Native Name : mTete.

49. **B. Randii** *Bak. fil.* in Journ. Bot. 1899 : 433.
B. spicaeformis var. *parviflora* Benth. in Trans. Linn. Soc. 25 : 313 (1866).

Belgian Congo : near Elisabethville, *Ringoet* in *Herb. Burtt Davy* 17846b !

Tanganyika Territory : Robeho, Lat. 6° 38′ S., alt. 4700 ft., *Speke* and *Grant* 32.

Nyasaland : Mlanje Plateau, at 2000 m., small tree 15–20 ft. high with rather flat crown, fl. and fr. Oct. 1905, *Purves* 208 !

Rhodesia : S. Rhodesia; Salisbury, *Rand* 610, 611 (types) ! a frequent tree of good size, on the Mashonaland Hills; flowers sweet-scented. Near Salisbury about 1600 m. tree 20–40 ft. fl. Oct. 1916, *Eyles* 648 ! large spreading tree, common, fl. Sep 1917, *Eyles* 845 ! *Rogers* 5796 ! Umtali Div., Odzani River Valley, 1914, *Teague* 301 ! Victoria Falls, in Sandveld, *Burtt Davy* 17834 ! *Gibbs* 145 ! Livingstone, *Rogers* 17456 ! without locality, in 1870,

Baines! Queque, *Rogers* 5845 ; Sebakwe, about 1350 m., large tree fl. Sep. 1904, *Eyles* 174! Victoria, *Monro* 456! 468! 526! 540!

Native Names : mSaassa (*Rand*, *Eyles*), mChenga or mNenga (*Speke* and *Grant*), mChenga (*Purves*).

According to Speke and Grant the bark is made into quilts, cloths, band-boxes, huge grain-stores, mats, roofing for camp huts, etc., and a red juice exudes on cutting the bark. Purves also states that a cloth is made from the inner bark. According to Rand the inner bark is used by the natives for twine or rope; they prepare it very quickly and readily by rubbing between the palms of the hands. The tree is very plentiful, and yields large quantities of a gum deep red in colour and very rich in tannin; it should be of some commercial value (*Rand*).

50. **B. Bragaei** *Harms* in Engl. Bot. Jahrb. 30 : 82 (1901).

Portuguese East Africa : Moçambique Territory; Beira, *Braga* 152 (type)!

Rhodesia : S. Rhodesia; Melsetter Distr., about 200 m., fl. Sep. 1907, a smallish tree, stamens white, *Swynnerton* 657! Nyahodi River at 1650 m., a small tree, *Swynnerton* 1027!

"One of the commonest S. Rhodesian trees; fairly plentiful in the neighbourhood of Chirinda and about Chikore and groves of it are common in the hills all along the Nyahodi and Haroni Rivers, and cover the lower slopes of the Chimanimani foothills, while toward the summit one finds a few scattered trees, remarkably fine in sheltered positions even at 7000 ft." (*Swynnerton.*)

Native Name : mooTsatsa (*Swynnerton*).

The bark is largely used by the natives as a substitute for rope and, beaten soft, for bags; formerly employed in the manufacture of clothes and blankets. It is prized on account of being red in colour and comparatively soft and pliable. (*Swynnerton.*)

51. **Brachystegia Gairdnerae** *Hutch. et B. Davy*, sp. nov.

Arbor ; ramuli annotini gracillimi, 1·5 mm. crassi, glabri, lenticellati, hornotini glabri. *Alabastra* minuta, globosa, squamis ciliatis. *Folia* 4–5·5 cm. longa; rhachis glaber; foliola 2-juga, elliptica vel oblongo-elliptica, apice late et inaequaliter emarginata, basi unilateraliter rotundata, 2–3 cm. lata, chartaceo-glabra, reticulata; nervi laterales ascendentes, utrinque prominuli; stipulae deciduae, lineari-lanceolatae, circiter 2 mm. longae, glabrae; stipelae conspicuae, parce ciliatae. *Inflorescentia* spiciformis, circiter 3 cm. longa; axis glaber; bracteae lineares, 3 mm. longae, superne ciliatae; pedicelli graciles, parce pubescentes, 5 mm. longi. *Bracteolae* obovato-oblongae, 7 mm. longae, 3·5 mm. latae, parce pubescentes. *Sepala* nulla. *Tubus staminalis* circiter 2 mm. longus. *Ovarium* stipitatum, parce hirsutum.

Rhodesia : N.W. Rhodesia; Sesheke District, *Miss A. E. Gairdner* 220!

52. **Brachystegia edulis** *Hutch. et B. Davy*, sp. nov.

Arbor magna, patula; ramuli annotini breves, pubescentes, circiter 1·5–2 mm. crassi. *Alabastra* conica, 4–5 mm. longa, pubescentia. *Folia* ad 12 cm. longa; rhachis infra foliola late expansus, glabrescens; foliola 3–5-juga, elliptica vel elliptico-lanceolata, apice obtusa, basi oblique rotundata, inferiora 1·5–2 cm. longa, 1–2·5 cm. lata, terminalia 5–6 cm. longa, 2–2·5 cm. lata, chartacea, glabra et nitida, prominenter nervosa et reticulata; nervi laterales ascendentes; stipulae deciduae; stipelae prominentes. *Inflorescentia* spiciformis, circiter 3 cm. longa; axis glabrescens; pedicelli graciles, 4 mm. longi, pubescentes. *Bracteolae* obovato-oblongae, circiter 5 mm. longae, pubescentes. *Sepalum* 1, lineare, 2 mm. longum, ciliolatum. *Ovarium* breviter stipitatum, parce hirsutum. *Legumen* lignosum, 3·5 cm. latum, glabrum.

Kenya Colony: Coast districts; a large spreading tree forming open forests on sandy soil, *Battiscombe* 33! grows in almost pure sand, *Webber* in *Herb. Battiscombe* 604! Shimba Hills (coast), *Battiscombe* 109!

Tanganyika Territory: Nyasa Highlands; Kyimbila, (about 1200 m.) tree with a thick crown, fl. Nov. 1910, *Stolz* 400!

Nyasaland: Without locality, *Buchanan* 210!

Rhodesia: N.W. Rhodesia; Highlands of Batoka Country in 1860, *Kirk* (type)! near Muata Marija, about 1300 m., *Kirk!*

S. Rhodesia: Inyamadzi Valley, about 800 m., a smallish tree, fl. Sep. 8, 1906, *Swynnerton* 1024!

Timber easily worked, well-marked, not durable (*Battiscombe*).

Bark used for fibre (*Swynnerton*). Seeds eaten; bark fibrous, used for cloth (*Kirk*).

Native Names: mRihi (Kidyo), mRiti (Suswahili), mooTsaka (*Swynnerton*), moTondo (*Kirk*).

53. **B. euryophylla** *Harms* in Engl. Bot. Jahrb. 30: 82 (1901).

Tanganyika Territory: Usaramo; Ost-Ukami, *Stuhlmann* 8666 (type)!

54. **B. appendiculata** *Benth.* in Trans. Linn. Soc. 25: 313. t. 42 (1866).

Nyasaland: near Zomba and E. end of Lake Shirwa, fl. Oct. 1861, tree 20–40 ft., growing beside water, *Meller* (type)!

Species Brachystegiae excludendae vel non satis notae.

Allied to *Brachystegia eurycoma* is an incomplete specimen from Asaba, S. Nigeria (*Leslie* 40!) which probably represents an undescribed species; it is characterised by its long, linear semi-persistent stipules.

Berlinia globiflora *Hutch. et B. Davy*, comb. nov. *Brachystegia globiflora* Benth. in Hook. Ic. Pl. 14: 43 (1881); *Schotia* sp.? Oliver, Fl. Trop. Afr. 2: 310 (1871).

Tanganyika Territory: "Lake Tanganyika" *Cameron*! Usangu, *Goetze* 1031! Without locality, *Busse* 204!

Nyasaland: Shire Highlands, *Buchanan* 138 (type)! 321! *Adamson* 127! Mt. Mlanje, *Whyte*! Shire River, a good-sized tree, *Kirk*! Tanganyika Plateau, about 650–950 m., fr. July, *Whyte*! Missale, road to Loangwane, a spreading tree 30–35 ft. high, fl. July 1897, *Nicholson*!

Portuguese E. Africa: Moçambique Territory; Madanda Forest at Amcate, *Swynnerton* 1025! Mossurizi, in woods between Chidoco and Mazani, fl. Feb. 1907, *W. H. Johnson* 106! *Lawrence* in *herb. Swynnerton* 165!

Rhodesia: S. Rhodesia; Melsetter District, common on poor shaly or sandy ground in the open woods near Chirinda, *Swynnerton* 6506! Umtali Div.; Odzani River Valley, *Teague* 80! Salisbury District, about 1600 m., fl. Jan. 1918, *Eyles* 913! *Marshall!* Cleveland Dam, a large tree, common about 1660 m., fl. Feb. 1917, *Eyles* 664! Growing in company with *Brachystegia Randii*, *Rand* 1407! Without locality *Monro* 970! N.W. Rhodesia; Batoka Highlands, fr. July 1860, *Kirk*!

Belgian Congo: open grass flats on the Lukifwa River, *Kassner* 2852!

Native Names: mNondo (*Eyles*, *Monro*), Mutondo (*Swynnerton*), mSaasa (*Marshall*).

Kirk states that in the Batoka Highlands the bark is fibrous and used for making cloth.

References.

(1) Sim, T. R., The Forest Flora and Forest Resources of Portuguese East Africa; 1909.

(2) Burtt Davy, J. Brachystegia Bark-cloth, in Transvaal Agricultural Journal 5: 459 (1907).

(3) Roscoe, The Rev. John; The Soul of Central Africa, pp. 169-171.

(4) According to Dawe, *Ficus natalensis* Hochst., of which the vernacular name is *Sango*, is reputed to yield the best bark-cloth of Uganda, sold amongst the natives at R 2 per piece (Hutchinson, in Fl. Trop. Afr. 6: sect. 2, 208).

(5) Grant reports *Dalbergia melanoxylon* Guill. & Perr. as being used for this purpose.

(6) Roscoe, The Rev. John; Twenty-five years in East Africa: pp. 99, 182, 221; plates III & XIV, Cambridge University Press (1921).

XIV.—CONTRIBUTIONS TO THE FLORA OF SINALOA: II.*

L. A. M. Riley.

Linaceae.

Linum Cruciata *Planch.*; SBH. 275.
Sierra Madre, *Seemann* 2166.

Malpighiaceae.

Byrsonima crassifolia (*L.*) *DC.*; CNH. v. 217; Zoe, v. 204; N. Am. Fl. xxv. 168.—*B. cotinifolia* H.B.K.; S B H. 273.

* Continued from *K.B.* 1923, p. 115.

Colomas, *Rose* 1807; Cerro Colorado, *Brandegee;* Cerro de Pinal, *Seemann* 1520. San Ignacio: Arroyo de Tacuitapa, 280 m. *Gonzalez* 349.

Vernacular name "Nanche."

Niedenzu treats *B. crassifolia* and *B. cotinifolia* as separate species, but states that transitional forms occur (De Genere Byrsonima, ii. 19, adnot.)

Malpighia umbellata *Rose* in CNH. i. 310, t. 29 (1895); Zoe v. 204; N. Am. Fl. xxv. 156.

Agiabampo, *Palmer* 799; Culiacan, *Brandegee.*

Vernacular name "Mora de Campo."

Thryallis angustifolia (*Benth.*) *Kuntze;* CNH. xii. 280; N. Am. Fl. xxv. 152.

"The common species of the west coast of Mexico" (Rose).

T. dasycarpa *Small* in N. Am. Fl. xxv. 151 (1910).

Rosario, *Lamb* 470.

T. glauca (*Cav.*) *Kuntze;* N. Am. Fl. xxv. 150.—*Galphimia glauca* Cav.; SBH. 274.

Santa Lucia, *Seemann* 2149; without locality, *Gonzalez* 1085.

Vernacular name "Hierba del Venado."

T. Palmeri *Rose* in CNH. xii. 281; N. Am. Fl. xxv. 151.—*Galphimia glandulosa* Rose in CNH. v. 137 (1897), non Cav.

San Ignacio; Pueblo del Limon, 280 m., *Gonzalez* 140.

Vernacular name "San Vicente."

I have not seen the type of *T. Palmeri*, and have identified Gonzalez' plant from Rose's and Small's descriptions.

T. tuberculata *Rose* in CNH. xii. 281 (1909).

Between Rosario and Colomas, *Rose* 1607.

T. vestita (*S. Wats.*) *Rose;* CNH. xii. 281; N. Am. Fl. xxv. 152. —*Galphimia vestita* S. Wats.; Zoe v. 204.

Cofradia, *Brandegee.*

Echinopterys eglandulosa (*A. Juss.*) *Small;* N. Am. Fl. xxv. 148. —*E. Lappula* A. Juss.; SBH. 274.

Sierra Madre, *Seemann* 2151. Cosala: Conitaca, 130 m. *Gonzalez* 821.

Banisteria arborescens (*Brandegee*) *Small;* N. Am. Fl. xxv. 135. —*Heteropterys arborescens* Brandegee in Zoe v. 203 (1905).

Cerro Colorado, *Brandegee.*

B. laurifolia *L.;* N. Am. Fl. xxv. 137.—*Heteropterys laurifolia* Juss. *H. floribunda* H. B. K.

San Ignacio: Arroyo de los Arrayanes, 320 m., *Gonzalez* 354.

B. Palmeri (*Rose*) *C. B. Robinson;* N. Am. Fl. xxv. 135.—*Heteropteris Palmeri* Rose.

San Ignacio: Aguaje de Barrabas, 95 m., *Gonzalez* 641; Falda del C. del Perico, 450 m., *Gonzalez* 536.

Vernacular name "Bejuco Huesillo."

I have not seen the type of *B. Palmeri;* numbers 536 and 641 were so determined at Washington according to Señor Gonzalez.

Mascagnia macroptera (*Moc. et Sessé*) var. **flabellariicarpa** *Niedenzu*, De Gen. Mascagnia, 27 (1908).

Villa Union, *Lamb* 397. San Ignacio: R. de los de Ponce, 260 m., *Gonzalez* 130.

Vernacular name "Mata-nene."

Niedenzu regarded *M. macroptera* (with two varieties *flabellariicarpa* and *Jussieuana*) and *M. septentrionalis* as independent species. Small, on the other hand, treated *M. septentrionalis* as a synonym of *M. macroptera*, and recognized no varieties. The varieties *flabellariicarpa* and *Jussieuana* seem, however, to be specifically distinct. The former is apparently confined to northwestern Mexico and the latter to eastern Mexico.

Gaudichaudia mucronata (*Moc. et Sessé*) *A. Juss.;* N. Am. Fl. xxv. 130.—*Hiraea mucronata* Moc. et Sessé. *Gaudichaudia filipendula* A. Juss.; Zoe v. 203.

Culiacan and Cofradia, *Brandegee.*

Janusia mexicana *Brandegee* in Zoe v. 203.

Cerro Colorado and Culiacan, *Brandegee.*

Zygophyllaceae.

Kallstroemia californica (*S. Wats.*) *Vail;* Rydberg in N. Am. Fl. xxv. 112.—*Tribulus californicus* S. Wats.

Sinaloa (fide Rydberg).

K. canescens *Rydberg*, l.c. 113 (1910).

Rosario, *Rose* 1547.

K. grandiflora *Torr.;* Rydberg, l.c. 114.—*Tribulus grandiflorus* Benth. et Hook. f.; CNH. i. 312.

Agiabampo, *Palmer* 1110.

K. longipes *Rydberg*, l.c.

Rosario, *Rose* 1829.

K. maxima (*L.*) *Torr. et Gray;* Rydberg, l.c. 111.—*Tribulus maximus* L.; CNH. i. 312.

Agiabampo, *Palmer* 786.

Guaiacum Coulteri *A. Gray;* Rydberg, l.c. 107; Fedde Rep. xiv. 106.

San Ignacio: R. de Piedras de Lumbre, 50 m. *Gonzalez* 145. Coast-region near Topolobampo in open woods on the Becerros estate, *Endlich* 709.

Vernacular name "Guayacan."

Geraniaceae.

Geranium Hernandesii *DC.;* Moc. et Sessé Ic. Ined. t. 147.—*G. carolinianum* Seem. Bot. Herald, 274, non L.

Colder parts of the Sierra Madre, *Seemann* 2165.

Seemann's plant from the Western Sierra Madre has a denser indumentum, leaves with a greater tendency to be quinquepartite, and sepals with distinctly shorter apiculi than the specimens from Mexico, San Luis Potosi and Oaxaca referred to *G. Hernandesii* by Peyritsch (Linnaea, xxx. 65), S. Watson (Proc. Am. Acad. xxvii. 334) and Knuth (Engl. Pflanzenreich, Geran. 193). In all these respects it agrees more closely with Mociño and Sessé's figure of *G. Hernandesii*.

Oxalidaceae.

Oxalis lanceolata (*Small*) *Riley*, comb. nov.—*Ionoxalis lanceolata* Small in N. Am. Fl. xxv. 35 (1907); CNH. xiii. 304.

Colomas, *Rose* 1651.

O. primavera (*Rose*) *Riley*, comb. nov.—*Ionoxalis primavera* Rose in CNH. x. 114 (1906); N. Am. Fl. xxv. 44.

"Very common in the lowlands of Tepic and Sinaloa" (Rose).

O. sepium *St. Hil.*—*Lotoxalis dichotoma* Rose in CNH. x. 115 (1906). *L. sepium* Small in N. Am. Fl. xxv. 48.

Foothills of the Sierra Madre near Colomas, *Rose* 1650.

O. Trientalis (*Small*) *Riley*, comb. nov.—*Ionoxalis Trientalis* Small in N. Am. Fl. xxv. 35 (1907); CNH. xiii. 306.

Near Colomas, *Rose* 3217.

O. yucatanensis (*Rose*) *Riley*, comb. nov.—*Lotoxalis yucatanensis* Rose in CNH. x. 116 (1906). *L. occidentalis* Rose, l.c. 115; N. Am. Fl. xxv. 48.

On the road between Rosario and Concepción, *Rose* 3265.

Rutaceae.

Xanthoxylum arborescens *Rose* in CNH. v. 112 (1897); Zoe v. 204; N. Am. Fl. xxv. 195.

Along river banks and in arroyos, Ymala, *Palmer* 1454, 1455, 1405a; Culiacan and Cofradia, *Brandegee*.

X. Fagara (*L.*) *Sargent;* N. Am. Fl. xxv. 190.—*X. Pterota* H.B.K.; CNH. v. 112, 164; Zoe v. 204.

Ymala, *Palmer* 1424; Rosario, *Rose* 1586; Culiacan, *Brandegee*.

X. Goldmani *Rose* in N. Am. Fl. xxv. 195 (1911).

On the road from Culiacan to Las Flechas, *Goldman* 311.

X. occidentale *Rose* in CNH. v. 164 (1899).—*X. caribaeum* P. Wilson in N. Am. Fl. xxv. 193, partim, non Lam.

Rosario, *Rose* 1820; Sinaloa without locality, *Gonzalez* 673. Vernacular name "Zorrillo."

X. occidentale is treated by P. Wilson, l.c., as a synonym of *X. caribaeum* Lam. which appears to be confined to the West Indies and the northern littoral of South America. It differs from the latter in the smaller leaflets with about twice as many and more convex crenae, and in the non-suberose sepals.

Esenbeckia Hartmanii, *Robinson et Fernald* in PAA. xxx. 115 (1894); CNH. v. 111; N. Am. Fl. xxv. 200.

Culiacan, *Palmer* 1801.

Casimiroa edulis *La Llave et Lex.;* SBH. 273; CNH. v. 165, 217; N. Am. Fl. xxv. 214; Popenoe, Man. Trop. Fruits, 445.

Frequent in the states of Sinaloa and Durango, both wild and cultivated, *Seemann* 2137; Mazatlan, *Rose* 3105. San Ignacio: Arroyo de Chinacates, 80 m. *Gonzalez* 166.

Vernacular names "Zapote blanco" "Zapote dormilon."

Citrus medica *L.;* Kew Bull. 1894, 177; Kew Bull. Add. Ser. ix. 131; CNH. v. 165; N. Am. Fl. xxv. 222.

Near Colomas, *Rose* 1740. "A small tree in the foothills growing as an escape."

Simarubaceae.

Alvaradoa amorphoides *Liebm.;* N. Am. Fl. xxv. 239; Fedde Rep. xiv. 107.

San Ignacio: El Bado hondo, 400 m. *Gonzalez* 770. Choix: in woods between Hornillo and Choix, 100 m., *Endlich* 729.

Vernacular names "Pié de Gallo" (Gonzalez), "Añil negro" (Endlich).

Ochnaceae.

Ouratea sp.

Escuinapa: Cerrito del Fuerte, 30 m., *Gonzalez* 1134.

Vernacular name "Palo Chino."

Gonzalez' material is insufficient for description. With the exception of a specimen from Acapulco (*Palmer* 412) I have no other records of the genus from Western Mexico.

Burseraceae.

Bursera arborea (*Rose*) *Riley,* comb. nov.—*Terebinthus arborea* Rose in CNH. x. 118 (1906). *Elaphrium arboreum* Rose in N. Am. Fl. xxv. 247.

Near Rosario, *Rose* 1821; between Rosario and Concepcion, *Rose* 3259a, 3259b, 3259e.

B. attenuata (*Rose*) *Riley,* comb. nov.—*Terebinthus attenuata* Rose in CNH xii. 278 (1909). *Elaphrium attenuatum* Rose in N. Am. Fl. xxv. 247.

Near Colomas, *Rose* 3213.

B. bipinnata (*DC*) *Engler;* Zoe v. 204.—*Elaphrium bipinnatum* Schlecht.; N. Am. Fl. xxv. 249. *Terebinthus bipinnata* W. F. Wight; CNH. x. 119.

Cerro Colorado, *Brandegee.*

B. collina *Brandegee* in Zoe v. 204 (1905).—*Elaphrium collinum* Rose in N. Am. Fl. xxv. 248.

Cofradia, *Brandegee.*

B. laxiflora *S. Wats.;* CNH. i. 313; Zoe v. 204; Fedde, Rep. xii. 224. *Terebinthus laxiflora* Rose; CNH. xii. 279. *Elaphrium laxiflorum* Rose in N. Am. Fl. xxv. 253.

Agiabampo, *Palmer* 797; Culiacan, *Brandegee;* between Choix and the upper Rio de Fuerte, 300–400 m., *Endlich* 786.

Vernacular name "Copal."

The resin mixed with hog's lard is used in the form of a poultice as a remedy for headache.

Bursera lonchophylla *Sprague et Riley*, sp. nov.; species nullae hucusque descriptae arcte affinis, a *B. odorata* Brandegee foliis 2–3-plo longioribus, foliolis anguste lanceolatis, drupa ovoidea valde cuspidata recedit.

Ramuli graciles, 2 mm. diametro 10 cm. infra apices, cinereo-fusci, glabri, hornotini sulcati, annotini subteretes, minutissime nigro-punctati. *Folia* pinnata, 3–5-juga, 5·5–7·5 cm. longa; rhachis gracilis, praeter internodium supremum leviter alatum aptera; internodia rhacheos 8–9 mm. longa; petioli 1·3–2 cm. longi; foliola sessilia vel brevissime petiolulata, anguste lanceolata, longe obtuse acuminata, in basin breviter angustata, inferiora minora 7–10 mm. longa, 2–3·5 mm. lata, superiora usque ad 2·7 cm. longa et 6 mm. lata, integra, tenuiter coriacea, glabra, opaca, supra costa conspicua, nervis lateralibus sub lente manifestis, subtus costa nigrescente conspicua rete venularum laxo. *Pedunculi* solitarii, uniflori, circiter 5 mm. longi, recurvi, vel biflori, 4 mm. longi, pedicellis 3 mm. longis. *Drupa* trivalvis, trigono-ovoidea, valde cuspidata, 8 mm. longa, 4·5 mm. diametro, nigra, rugulosa, glabra. *Pyrena* trigona, 5–6 mm. longa arillodio incluso, basi truncata, praeter aream basalem deltoideam arillodio ubique obtecta.

Sinaloa: Choix; Cerro del Muerto, 620 m., *Gonzalez* 896 (type in Herb. Kew.).

Vernacular names "Torote," "Chutama."

B. occidentalis (*Rose*) *Riley*, comb. nov.—*Elaphrium occidentale* Rose in N. Am. Fl. xxv. 246 (1911).

Between Rosario and Concepcion, *Rose* 3259 d.

B. Palmeri *S. Wats.;* Zoe v. 204.—*Terebinthus Palmeri* Rose in CNH. x. 121. *Elaphrium Palmeri* Rose in N. Am. Fl. xxv. 255.

Culiacan, *Brandegee.*

B. pilosa (*Engler*), *Riley*, comb. nov.—*B. graveolens* var. *pilosa* Engler in DC. Monogr. Phan. iv. 49 (1883). *Terebinthus pilosa* Rose in CNH. xii. 279. *Elaphrium pilosum* Rose in N. Am. Fl. xxv. 251.

"Southern Chihuahua and Sinaloa to Colima" (Rose).

B. rubra (*Rose*) *Riley*, comb. nov.—*Terebinthus rubra* Rose in CNH. x. 121 (1906). *Elaphrium rubrum* Rose in N. Am. Fl. xxv. 252.

Near Colomas, *Rose* 1670.

Bursera stenophylla *Sprague et Riley*, sp. nov.; affinis *B. bipinnatae* Engler, foliis laxius bipinnatis infructescentias duplo excedentibus, internodiis rhacheos longioribus, foliolis longis angustis ob internodia elongata pinnarum remotis, arillodio pyrenam circiter $\frac{1}{2}$–$\frac{2}{3}$ tegente facile distinguenda.

Ramuli satis graciles, vix ultra 2 mm. diametro 10 cm. infra apices, cinereo-fusci, costulati, hornotini angulati, minute pubescentes, annotini glabrati. *Folia* 5·5–13 cm. longa, bipinnata, nodis rhacheos 7–11, quorum superiores 3 (rarius 2–4) foliola solitaria sessilia, reliqui pinnas 1–6-jugas praeter nonnullas unifoliolatas ferunt; rhachis minute pilosa; rhachillae internodia ut rhacheos internodia superiora anguste alata; foliola lateralia pinnarum elliptico-vel-obovato-oblonga, apice obtussima, in basin ± oblique angustata, 3–7 mm. longa, 1·2–2·5 mm. lata, tenuiter coriacea vel chartacea, glabra, margine tandem ± revoluta, supra opaca rete venarum inconspicuo, subtus costa prominente rete distincto leviter impresso; foliola terminalia oblanceolato-linearia, 7–13 mm. longa, 1·5–2 mm. lata. *Infructescentia* rhachi 2–2·5 cm. longa sulcata minute pilosa. *Drupa* bivalvis, ellipsoidea, apiculata, 8–9 mm. longa, 5 mm. diametro, striata, glabra. *Pyrena* compresso-ovoidea, acuta, 5–6 mm. longa, 4–4·5 mm. lata, $\frac{1}{2}$–$\frac{2}{3}$ tantum arillodio obtecta.—*B. bipinnata* S. Wats. in Proc. Am. Acad. xxi. 421 (1886), non Engl.

South-western Chihuahua: Hacienda San Miguel, *Palmer* 200 (type in Herb. Kew.). Sinaloa: Choix, Las Jicaras, 500 m., *Gonzalez* 894.

Vernacular names "Jaboncillo" (Chihuahua) "Palo Copal" (Sinaloa).

According to Palmer, *B. stenophylla* is a "copal-varnish tree," 10 ft. high and 2–6 in. in diameter, with short compact branches and very brittle wood. The nut is black, and is covered below with a fleshy orange-coloured pulp (the aril-like mesocarp).

B. tenuifolia *Rose* in CNH. iii. 314 (1895); Zoe v. 204 ("*Bursera tenuiflora* Rose").—*Terebinthus tenuifolia* Rose in CNH. x. 122. *Elaphrium tenuifolium* Rose in Am. Fl. xxv. 252.

Lodiego, *Palmer* 1581; Culiacan, *Brandegee*.

B. sp.

San Ignacio: Rancho del Zapote, 540 m., *Gonzalez* 413. Vernacular name "Copalillo."

Possibly a form of *B. acutidens* Sprague et Riley (*see* below), but the specimen is without fruit and cannot be determined with certainty. The leaves are less pilose, and the leaflets more coarsely toothed than in the type of *B. acutidens*.

[Descriptions of two new Mexican species of *Bursera* are appended.

Bursera acutidens *Sprague et Riley*, sp. nov.; affinis *B. Palmeri* S. Wats., foliolis planis tenuioribus, subtus grosse pubescentibus nec tomentosis, rhacheos alis acute dentatis, drupa obtusiore magis pilosa, pyrena subglobosa haud alata distinguenda.

Rami flexuosi, crassi, striati, circiter 5 mm. diametro 10 cm. infra apices, juventute fulvo-velutini, demum grosse pubescentes, cinerei. *Folia* 14–17 cm. longa, 9·5–11·5 cm. lata, pinnata, 3-juga; petioli 3–4·5 cm. longi, hirsuti; rhacheos internodia 2·5–3 cm. longa, alata, alarum superficie lineari-oblanceolata acute dentata dentibus depresso-deltoideis; foliola elliptico-oblonga vel inferiora ovata, apice acuta, basi subcuneata, 3·5–7 cm. longa, 2·2–3·5 cm. lata, grosse subdupliciter serrata, chartacea, plana, supra aspere, subtus densius pubescentia. *Infructescentiae* 1·5–2·5 cm. longae; rhachis angulata, dense hirsuta; pedicelli 2–3 mm. longi. *Drupa* 2-valvis, ovoidea, 8–10 mm. longa, rugosa, pilosa. *Pyrena* arillodio tenui obtecta, subglobosa, 5·5 mm. diametro, fulva, concolor vel superne bimaculata maculis nigriusculis.

Colima: Manzanillo, *Palmer* 987 (type in herb. Kew.). The specific name is given in allusion to the sharply-toothed wings of the leaf-rhachis.

Bursera sphaerocarpa *Sprague et Riley*, sp.nov.; affinis *B. Palmeri* S. Wats., a qua foliolis non rugosis, infructescentiis longioribus, drupa majore subglobosa, pyrena lenticulari recedit.

Rami flexuosi, crassi, striati, 6 mm. diametro 10 cm. infra apices, juventute fulvo-velutini, tandem glabrati, cinerei. *Folia* 10–15 cm. longa, 8–10 cm. lata, pinnata, 4–5-juga; petioli 2–3·5 cm. longi, sparse velutini; rhacheos internodia 1–2 cm. longa, late alata, alarum superficie oblanceolata grosse crenata; foliola ovato-oblonga, apice acuta vel breviter acute acuminata, basi oblique rotundata, 3·5–5·5 cm. longa, 1·5–2·8 cm. lata, grosse subdupliciter crenato-serrata, subcoriacea, plana, supra aspere velutino-pubescentia, subtus tomentosa. *Infructescentiae* 2–5 cm. longae; rhachis angulata, crispule hirsuta; pedicelli 2–3 mm. longi. *Drupa* bivalvis, subglobosa, fere 1 cm. diametro, non apiculata, rugosa, nitidula, glabra. *Pyrena* arillodio omnino obtecta, crasse lenticularia, 6·5 mm. diametro, infra medium anguste alata, glanduloso-tuberculata, fulva, hilo parvo, area parva apicali pallidiore, dimidio altero circulo impresso 5–5·5 mm. diametro notato (signo externo loculi abortivi).

Guerrero: Acapulco, *Palmer* 432 (type in herb. Kew.).]

Meliaceae.

Trichilia colimana *C. DC.* (?); Zoe v. 204.

Culiacan, *Brandegee* (ex op. cit.).

T. havanensis var. **spatulata** *Rose* in CNH. i. 314 (1895).

San Ignacio: La Estancia, 40 m., *Gonzalez* 190.

Vernacular names "Canache" (Sinaloa), "Garrapatilla" (Colima).

Cedrela occidentalis *C. DC. et Rose* in CNH. v. 190 (1899).

Choix: Tasajera, 440 m., *Gonzalez* 899.

Vernacular names "Cedro," "Spanish Cedar."

Olacaceae.

Ximenia parviflora *Benth.;* SBH. 345; CNH. xxiii. 237.
Sierra Madre, *Seemann* 2156; Sinaloa (fide Standley).

Schoepfia parvifolia *Planch.*; CNH. xxiii. 238.
Sinaloa (fide Standley).
Vernacular names "Tecolotillo," "Palo fierro."

Celastraceae.

Maytenus phyllanthoides *Benth.;* Fedde, Rep. viii. 291.
Coast-region near Topolobampo, at the Hacienda Correrepe, *Endlich* 693.
Vernacular names "Aguabola," "Mangle aguabola."
The leaves are used as a remedy for scurvy and toothache.

Wimmeria confusa *Hemsl.* Diagn. Pl. Nov. i. 6 (July, 1878); Biol. i. 192; CNH. v. 129; Fedde Rep. viii. 293.—*W. pallida* Radlk. in Sitzb. Bayer. Akad. 1878, 379 (Ueber Sapindus etc.), as to *Hartweg* 41.
Lodiego, *Palmer* 1598; woods near Choix, 100 m., *Endlich* 722. San Ignacio: Cerro de Perico, 680 m., *Gonzalez* 541.
Vernacular name "Algodoncillo."
Radlkofer based *Wimmeria pallida* on flowering material collected by Hartweg, and fruiting specimens collected by Haenke and Liebmann. Rose (CNH. v. 130) considers that the fruiting specimens represent a different species, to which he applies the name *W. pallida* Radlk. emend.

Hippocrateaceae.

Hippocratea mexicana *Miers;* Zoe v. 209.
Cerro Colorado, *Brandegee.*

H. pauciflora *Rose* in CNH. v. 197 (1899).
Near Rosario, *Rose* 1587.

H. utilis *Rose*, l.c.
Near Colomas, in the foothills of the Sierra Madre, *Rose* 1706.
Vernacular name "Bejuco Colorado."

Rhamnaceae.

Zizyphus Endlichii *Loes.* in Fedde, Rep. viii. 296 (1910).
Open woods in the coast-region near Topolobampo, *Endlich* 696.
Vernacular names "Nanche," "Ceituna."
The fruits are edible, and the bark is used as a remedy for toothache.

Z. sonorensis *S. Wats.*; Zoe v. 210.
Altata, *Brandegee.* San Ignacio: Los Chinacates, 90 m. *Gonzalez* 160.
Vernacular name "Nanche de la Costa."

Condalia obovata *Hook.* var. **angustifolia** *Loes.* in Fedde, Rep. viii. 297 (1910).

Coast-region near Topolobampo, in woods at the Hacienda Correrepe, *Endlich* 673.

Vernacular name "Mezquitillo."

A paste prepared from the white wood-ash is used by carpenters for scribing timber.

Karwinskia glandulosa *Zucc.* Pl. Nov. fasc. 1, 351, t. 16 (Abh. Akad. München, i.; 1832).

Choix; Tasajera, 440 m., *Gonzalez* 879.

Vernacular name "Cacachila cina."

Trelease (Syn. Fl. N. Am. i. part 1, 405) unites the above species with *K. Humboldtiana* Zucc., from which, however, it appears distinct on account of the smaller oblong-elliptic leaves with more numerous glands, and the long acuminate sepals.

K. Humboldtiana *Zucc.* Pl. Nov. fasc. 1, 353 (Abh. Akad. München, i.; 1832); Syn. Fl. N. Am. i. part 1, 405; CNH. v. 229; Fedde, Rep. viii. 297.—*Rhamnus Humboldtianus* Roem. et Schult.; H.B.K. Nov. Gen. vii. 52, t. 618.

Colomas, *Rose;* coast-region near Topolobampo, in open woods at the Hacienda Correrepe, *Endlich*. San Ignacio: near town of San Ignacio, 150 m., *Gonzalez* 422.

Vernacular names "Margarita," "Frutillo," "Negrito," "Capulincillo," "Capulin cimarron," "Coyotillo," "Tullidor," "Tullidora," "Cacachila."

The fruit is used as a remedy for tetanus. When eaten in excess by men or domestic animals it produces convulsive movements in the joints. The leaves are used with salt as a febrifuge, and also possess cathartic properties.

K. parvifolia *Rose* in CNH. i. 315, t. 31 (1895).

Agiabampo, *Palmer* 773.

Rhamnus dianthes *Riley*, sp. nov.; nullis speciebus mexicanis hucusque descriptis affinis, ramulis tomentosis, foliis breviter petiolatis elliptico- vel ovato-oblongis apiculatis discoloribus, supra velutinis nervis impressis, subtus tomentellis nervis valde prominentibus, margine reflexo, floribus in axillis geminatis, facile cognoscitur.

Rami nodulosi, circiter 3 mm. diametro 2 dm. infra apices, hornotini fulvo-tomentosi, annotini fuscescentes. *Folia* breviter petiolata, elliptico- vel ovato-oblonga, apiculata, basi rotundata vel obtusa, 2–4·5 cm. longa, 1–2 cm. lata, integra, margine reflexo, coriacea, discolora, supra breviter velutina, nervis impressis, subtus pallide tomentella, nervis valde prominentibus, rete venularum prominente; nervi laterales obliqui, paralleli, utrinsecus 6–8; petioli 2–4 mm. longi, tomentosi; stipulae subulatae, diu persistentes. *Flores* in axillis gemini; pedicelli sub fructu 5–6 mm. longi, deflexo-arcuati, tomentelli. *Calycis tubus* 1 mm. longus; lobi deltoidei, acuti, 1·7–1·8 mm. longi, basi 1·5 mm. lati. *Petala* 1·2 mm. longa, apice emarginato sinu 0·3 mm. alto. *Filamenta* e basi deltoidea angustata, 0·7 mm. longa;

antherae 0·5–0·6 mm. longae. *Drupa* subglobosa, circiter 5 mm. diametro, stylo persistente 1 mm. longo coronata. *Pyrenae* compresso-ellipsoideae, 4·5 mm. longae, 3 mm. crassae. —*R. tomentellus* Seem. Bot. Herald, 275 (1856), non Benth. *R. californicus* Hemsl. Biol. 197 (1880), non Eschsch.

Sierra Madre, *Seemann* 2155 (type in Herb. Kew.).

Rhamnus Gonzalezii *Riley*, sp. nov.; affinis *R. spinoso* Hemsl. foliis minoribus pro rata angustioribus subtus hirsutioribus, pedicellis brevibus robustis hirsutissimis distinguitur.

Rami et ramuli rigidi, leviter flexuosi, sulcati, valde lenticellati, cinerei, ferrugineo-hirsuti, tandem glabrati; rami 30 cm. infra apices 3·5 mm. diametientes; ramuli patuli, 7–10 cm. longi. *Folia* alterna, petiolata, elliptica vel rhomboideo-elliptica, apice emarginata, longe mucronata, 3–4·5 cm. longa, 1·5–2·5 cm. lata (rarius ad 7 cm. longa et 3·5 cm. lata), integra, supra opaca, glabrata, subtus costa nervisque hirsutis ceterum sparse hirsuta vel glabrescentia; petioli 5–7 mm. longi, ferrugineo-hirsuti; stipulae spinescentes, circiter 4 mm. longae, glabrescentes. *Flores* in axillis fasciculati, pedicellis robustis 2–3 mm. longis dense ferrugineo-hirsutis, pilis ascendentibus. *Calycis tubus* 0·75 mm. longus, hirsutissimus; lobi ovato-triangulares, obtusi, 1·25 mm. longi, basi 1 mm. lati, glabrescentes. *Petala* cucullata, breviter unguiculata, 1 mm. longa, glabra. *Filamenta* 1 mm. longa, ad basin sensim dilatata, glabra. *Stylus* 1 mm. longus, trifidus, glaber. *Fructus* non visus.

Sinaloa: San Ignacio; Cerro de la Nanche, San Agustin, 205 m. *Gonzalez* 628 (type in Herb. Kew.).

Vernacular name "Aleznillo."

Ceanothus buxifolius *Willd.* ex Roem. et Schultes, Syst. v. 300; H.B.K. Nov. Gen. vii. 62, t. 615; SBH. 276; Hemsl. Biol. i. 199 (excl. *Parry et Palmer* 122).

Sierra Madre, in forests, *Seemann* 2158.

C. caeruleus *Lag.* Gen. et Sp. 11 (1816); Lodd. Bot. Cab. t. 110; Roem. et Schultes, Syst. v. 298; H.B.K. Nov. Gen. vii. 63; Hemsl., Biol. i. 199.—*C. azureus* Desf. Tabl. ed. 2, 232 (1815), nomen nudum; J. B. Ker, Bot. Reg. iv. t. 291 (1818), descr.; DC Prodr. ii. 31; Brongn. Mem. Rhamn. 77, t. 4, fig. 4 (Ann. Sc. Nat. x. 384, t. 15, fig. 4; 1827); SBH. 276; Hemsl. Biol. i. 199. *C. bicolor* Willd. ex Roem. et Schultes, Syst. v. 300 (1819).

Sierra Madre, *Seemann* 2157, and without number.

The earliest name proposed for the species was *C. azureus* Desf., which was published as a "nomen nudum" in 1815, and was not validated by description until 1818. As the name *C. caeruleus* Lag. was published with a description in 1816, it should be adopted under International Rules.

Rose treats *Pringle* 11395 (Federal District, near Eslava) and *Bourgeau* 994 (San Nicolas) as a new species, *C. Candolleanus*, to which he refers *C. azureus* DC. as a synonym (Contrib. U.S.

Nat. Herb. xii. 283). He does not state how *C. Candolleanus* differs from *C. azureus* Desf., but seems to have separated it on account of the pedicels, which are glabrous as described by De Candolle. Ker, on the other hand, described *C. azureus* as having pilose pedicels. This character, however, seems to be variable. There are in the Kew Herbarium two specimens of *C. azureus* cultivated at Paris in 1816 (Herb. J. Gay); one has glabrous pedicels, the other densely pilose pedicels, but in other respects they are similar.

The material from Western Mexico has fewer-flowered inflorescences and smaller leaves than typical *C. caeruleus*, and may eventually have to be separated. *C. parvifolius* (S. Wats.) Rose, from Chihuahua, is undoubtedly distinct.

Cormonema Nelsoni *Rose* in CNH. iii. 315 (1895).
Lodiego, *Palmer* 1625.

Colubrina mexicana *Rose*, l.c.
Culiacan, *Palmer* 1526.

Gouania mexicana *Rose*, l.c. 314.
Culiacan, *Palmer* 1491; Ymala, *Palmer* 1694.

Vitaceae.

Ampelopsis mexicana *Rose* in CNH. viii. 51 (1903).
Near Rosario, *Rose* 1579.

Cissus rhombifolia *Vahl.*; Planch. in DC. Monogr. v. 107.—*Vitis rhombifolia* Baker.
Near Colomas, *Rose* 1697 (Hb. Kew.).

C. trifoliata *L.*; Urb. Symb. Antill. iv. 380; viii. 404.—*C. acida* L.; Planch. in DC. Monogr. v. 534.
Agiabampo, *Palmer* 784 (Hb. Kew.).

Sapindaceae.

Serjania rutaefolia *Radlk.* in CNH. i. 316 (1895).
Agiambampo, *Palmer* 795.

Serjania sp.?
Cosalá: C. del Platano at Conitaca, 150 m. *Gonzalez* 826. The flowers are too immature for accurate determination.

[**Cardiospermum Halicacabum** L.; Kew Bull. Add. Ser. ix. 165.
Widely distributed throughout the subtropical and tropical regions of the world and doubtless occurs in Sinaloa.]

Paullinia fuscescens *H.B.K.*: Radlk. Monogr. 209.—*P. velutina* DC.
Cosalá: Conitaca, 280 m., *Gonzalez* 798.
Vernacular name "Bejuco Costillón."

Sapindus Saponaria *L.*; Desc. Fl. Ant. iv. 121, t. 261; Radlk. in Mart. Fl. Bras. xiii. pars. 3, 512, t. 109; Sarg. Silv. ii. 68, 69, tt. 74, 75; CNH. v. 236.

San Ignacio : Laguna Seca, 40 m. *Gonzalez* 200.
Vernacular name " Boliche."

Dodonaea viscosa *L.;* SBH. 274; Radlk. in Mart. Fl. Bras. xiii. pars. 3, 639.
Sierra Madre, *Seemann* 2152.

ANACARDIACEAE.

Rhus sp.
San Ignacio, 700 m. *Gonzalez* 832. Apparently a new species related to *R. Palmeri* Rose, but the material is insufficient for description.

Comocladia macrophylla (*Hook. et Arn.*) *Riley*, comb. nov.—*Rhus macrophylla* Hook. et Arn. Bot. Beech. Voy. ii. 213 (1840–41); Engler in DC. Monogr. iv. 403.
Without precise locality, *Gonzalez* 1075.
Vernacular name " Hincha huevos."
The type specimen was collected at Acapulco. Gonzalez' specimen (a single leaf) is more pilose, but this is probably a question of age.

Mangifera indica *L.;* Kew Bull. Add. Ser. ix. 169; Popenoe, Man. Trop. Fruits, 81, tt. 5, 6; Burns and Prayag, The Book of the Mango (1921).
Rosario : Rancho Zapato, 1020 m., *Gonzalez* 1164.
Vernacular name " Mango."

Spondias mexicana *S. Wats.* in PAA. xxii. 403 (1887); CNH. v. 219.
" In 1887 Dr. S. Watson described from Tequila, State of Jalisco, a yellow-fruited form under the name of *S. mexicana* which appears to be the 'ciruela amarilla,' cultivated and sold on the west coast as far north as Guaymas " (Rose).

XV.—MISCELLANEOUS NOTES.

Buttresses.—Since the publication of a note on " Buttresses as an Assistance to Identification " (*K.B.* 1922, p. 265), a copy has been received of Mr. W. D. Francis' pamphlet " Some Characteristics of Queensland Rain Forests and Rain-Forest Trees,"* in which the general characteristics of the principal forest trees of Queensland are recorded in a manner which enables a worker in the field to arrive at their approximate identification. Except in the case of the carribin (*Sloanea Woolsii*) where the buttresses are recorded as curving outwards (compare *Cynometra* sp. *K.B.* 1922, p. 268) the proportion of the various sides of the buttress and the behaviour of the outer edge is not specifically referred to.

* Proc. Roy. Soc. Queensland, Vol. XXXIV., No. 12, Dec. 1922.

The characteristics which Mr. Francis has found may conveniently be noted in the field as an assistance to identification are as follows. Channelled or fluted barrels; conspicuously fissured barks; yellow inner barks; ochre-coloured inner barks; wrinkled surface in the sapwood; patches, streaks or specks of black wood similar to ebony; very soft woods; woods depositing brightly coloured ashes; coloured woods; large medullary rays (*Proteaceae*); laticiferous; wood or sap changing colour on exposure; odour of freshly cut bark or sapwood; deciduous leaves; brilliant leaf coloration in age.

In discussing buttresses generally the interesting observation is made that plank buttresses are common in all the luxuriant rain forests even in those at an altitude of 3,500 feet in latitude 28·2 degrees South, on the MacPherson Range, so that it can be definitely stated in Queensland, at any rate, that the phenomenon of well developed buttresses is not confined to the tropical forests, but occurs in relatively temperate climates when the annual rainfall approximates or exceeds 60 inches.

Original Drawings of the Botanical Magazine.—From the time when Sir William Hooker came to Kew in 1841 the original drawings for the Botanical Magazine plates have been preserved in the collection of drawings in the Herbarium; these were principally the work of Mr. W. H. Fitch and Miss M. Smith. In May, 1891, Kew was fortunate to secure 1625 plates of an earlier date from Mr. F. Curtis of Staines, a descendant of William Curtis, the founder of the Magazine. Further progress towards the completion of the set has now been made by the receipt of 165 drawings, mainly belonging to the period between August 1830, and August 1834, although one (t. 309) dates back to August 1795. These were purchased in 1922 from a member of the Curtis family by Mr. A. Bilney and presented by him to the Royal Horticultural Society, the Council of which, with Mr. Bilney's sanction, generously transferred them to Kew. Many of the drawings are by Sir W. J. Hooker and J. Curtis, while amongst the other artists are :—W. Herbert, t. 2385 (reproduction says, J. Curtis); Charles M. Curtis, t. 2619; James McNab, tt. 3025 and 3252; Dr. T. Nicholson, t. 3071; J. D. Sowerby, tt. 3078–3080; Mrs. Arnold Harrison, t. 3116; Dr. R. K. Greville, t. 3142; Sydenham Edwards, t. 3153; "E. D." t. 3155 (adapted by Sir W. J. Hooker); Dr. J. Scott, t. 3187; Rev. R. T. Lowe, tt. 3227 and 3234, and Dr. C. W. Short of Lexington, t. 3232. Many of the plates bear instructions from Sir W. J. Hooker (when editor) to Mr. George Graves as to colouring the lithographs, two letters on which are preserved in Sir W. Hooker's correspondence. The series furnishes interesting examples of the styles of the various artists.—C.H.W.

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